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February 27, 2009

Illinois Environmental Protection Agency  
Division of Land Pollution Control #33, Permits Section  
(Groundwater Monitoring Unit)  
1021 North Grand Avenue, East  
Springfield, IL 62702

**RE: 2008 RCRA Annual Groundwater Monitoring Report  
Former Koppers Company Wood Treating Facility  
Carbondale, Illinois  
EPA I.D. # ILD 000 819 946**

Greetings:

On behalf of Beazer East, Inc. (Beazer), enclosed is the 2008 Annual RCRA Groundwater Monitoring Report for the above-referenced facility. If you have any questions, please call Mr. Michael Slenska of Beazer at (412) 208-8857 or me at (412) 429-2694.

Best Regards,

Field & Technical Services, LLC

Angie Gatchie  
Data Manager

Enclosure

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**2008 ANNUAL RCRA GROUNDWATER  
MONITORING REPORT**

**FORMER KOPPERS WOOD-TREATING SITE  
CARBONDALE, ILLINOIS**

**EPA ID No. ILD 000 819 946**

*Prepared for:*

**Beazer East, Inc.**

*Prepared by:*

**Field & Technical Services, LLC**

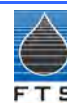
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**February 27, 2009**

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## ABBREVIATIONS/ACRONYMS

AOC	Areas of Concern
Beazer	Beazer East, Inc.
BM&S	Beazer Materials and Services, Inc.
BTEX	Benzene, Toluene, Ethylbenzene, and total Xylenes
CAMU	Corrective Action Management Unit
CZC	Chromated Zinc Chloride
DNAPL	Dense Non-Aqueous Phase Liquid
DO	Dissolved Oxygen
FCAP	Fluoro-Chrome-Arsenate Phenol
FTS	Field & Technical Services, LLC
IEPA	Illinois Environmental Protection Agency
IGMP	Interim Groundwater Monitoring Program
IWQC	Illinois Water Quality Criteria
Koppers Inc.	Koppers Industries, Inc.
NAPL	Non-Aqueous Phase Liquid
Non-Com	Non-Combustible fire retardant
O&M	Operations and Maintenance
ORP	Oxygen Reduction Potential
PAHs	Polynuclear Aromatic Hydrocarbons
RCRA	Resource Conservation and Recovery Act
Site	Former Koppers Wood-Treating Site, North Marion Street, immediately northeast of Carbondale in Jackson County, Illinois (ILD 000 819 946)
SOP	Standard Operation Procedure
TACO	Tiered Approach to Corrective Action Objectives (IEPA)
TEF	Toxicity Equivalent Factor
TEQ	Toxicity Equivalent Quotient
USEPA	United States Environmental Protection Agency

## 1.0 INTRODUCTION

Field & Technical Services, LLC (FTS), on behalf of Beazer East, Inc. (Beazer), prepared this 2008 Annual Resource Conservation and Recovery Act (RCRA) Groundwater Monitoring Report for the Former Koppers Wood-Treating Site (Site) in Carbondale, Illinois. This report satisfies Beazer's obligations under the United States Environmental Protection Agency (USEPA) Administrative Order on Consent and the Illinois Environmental Protection Agency (IEPA) Consent Decree. The USEPA Identification Number for the Site is ILD000819946, and the Illinois Site Inventory Number is 0778010002.

Beazer monitors Site groundwater on a semi-annual basis in accordance with the Interim Groundwater Monitoring Program (IGMP). The IGMP satisfies the requirements of the RCRA Interim Status closure and post-closure periods for the closed RCRA surface impoundments and was implemented in 1994 to evaluate Site-wide groundwater quality during the period between the completion of the remedial investigation and the initiation of remedial actions. The IEPA approved the original IGMP in January 1994, and the USEPA approved the revised IGMP in March 2001. Although remedial actions at the Site have been substantially completed, the IGMP will continue to be implemented until a long-term, post-remediation Groundwater Monitoring Plan (GMP) has been established (USEPA is currently reviewing a draft GMP).

This report provides a summary and evaluation of the groundwater monitoring data collected in 2008 and is organized into six sections.

- **Section 1** includes this introduction and report organization.
- **Section 2** reviews the Site background information, geology, and hydrogeology.
- **Section 3** presents information on the current monitoring program and well network at the Site, as well as field procedures.
- **Section 4** discusses the presence of non-aqueous phase liquid (NAPL), groundwater flow patterns and migration assessments, and vertical gradients at the Site.
- **Section 5** presents groundwater quality results.
- **Section 6** presents the conclusions and future activities.

## 2.0 SITE DESCRIPTION AND HISTORY

The Site is located on North Marion Street, immediately northeast of the city of Carbondale in Jackson County, Illinois. In approximately 1905, Ayer & Lord Tie Company began producing pressure-treated railroad crossties, utility poles, and other wood products at the Site. In 1940, Koppers Company purchased the facility. In 1944, Koppers Company was restructured and the Site became owned by Koppers Company, Inc. In 1988, Koppers Company, Inc. was acquired, indirectly, by a publicly-traded company known as Beazer PLC and the Site was sold to Koppers Industries, Inc. (Koppers Inc.). Included in this sale were all rights to the name “Koppers.” Consequently, the seller, Koppers Company, Inc., changed its name to Beazer Materials and Services, Inc. (BM&S) in 1989 and BM&S changed its name to Beazer East, Inc. in 1990. Koppers Inc. ceased wood-treating operations at the Site in 1991 and conveyed the Site to Beazer East, Inc. on February 24, 1992. During the years of operation, Koppers used a variety of chemicals at one time or another, including creosote, pentachlorophenol, fluoro-chrome-arsenate phenol (FCAP), chromated zinc chloride (CZC), and non-combustible fire retardant (Non-Com).

The USEPA and the IEPA identified the following eleven (11) areas of concern (AOCs) for the Site-wide monitoring program (as shown on Figure 1).

- Area 1 – the wood-treating cylinders
- Area 2 – the former sprayfield
- Area 3 – the drip track
- Area 4 – the former north drainage ditch
- Area 5 – the former wastepile area
- Area 6 – the former lagoon area
- Area 7 – the offsite spill area
- Area 8 – the service yard
- Area 9 – the storage tanks
- Area 10 – the closed RCRA surface impoundments
- Area 11 – the plant production area

Koppers Company discontinued use of the RCRA surface impoundment system (AOC 10) and sprayfield (AOC 2) in 1988, and excavated all sludge and visibly impacted soil from within the impoundments for disposal in a permitted landfill.





Beazer subsequently closed the surface impoundment system as a landfill (pursuant to the RCRA).

Beginning in 2004 and continuing through 2006, Beazer conducted various remediation activities as part of the RCRA corrective action program, including:

- Additional building/structure demolition in the former process area (completed).
- The relocation of part of Glade Creek (completed).
- The installation of a trench-based dense non-aqueous phase liquid (DNAPL) barrier near the former Glade Creek channel (completed).
- Construction of a containment cell within a Corrective Action Management Unit (CAMU) to consolidate/manage various materials generated during the remediation activities (ongoing).
- Excavation of waste piles and surficial “coal tar” materials from various areas of the Site (completed).
- Installation of a surface cover over the former Process Area (completed).
- Installation of a DNAPL recovery well at RW-23 (completed).
- Excavation of visually impacted Glade Creek sediments (completed).

Operation and maintenance (O&M) of the completed and ongoing remedial components – including the DNAPL barrier, DNAPL extraction wells, the wastewater treatment plant, and the CAMU containment cell – is being conducted. In addition to this O&M work, post-remediation groundwater monitoring will be conducted. Beazer submitted a draft long-term, post-remediation GMP on November 16, 2007. Beazer and the USEPA discussed the draft GMP during a July 2008 meeting, and a revised draft GMP was submitted to the USEPA on October 6, 2008, which is currently being reviewed by the USEPA. In the interim, groundwater monitoring continues to be performed under the IGMP, with approved modifications to reflect current Site conditions and the status of the remediation activities.

## 2.1 SITE GEOLOGY

Site geology is characterized by unconsolidated, Pleistocene age glacial sediments, which overlie Pennsylvanian age bedrock. The glacial sediments are approximately 50 to 110 feet thick. The uppermost glacial sediments range from approximately 25 to 45 feet thick and average approximately 40 feet thick. In general, these glacial deposits consist of silty clay with trace sand and occasional sand lenses (not more than several inches thick).

Below the uppermost glacial sediments are the shallow (upper) glacial sediment deposits consisting of gray or dark brown uniform (massive) silty clay. These sediments are noted for their lack of sand particles, fracture joints, or bedding, and are also characterized by an occasional isolated clayey silt layer or peat deposit. This massive clay unit appears to be continuous across the Site and varies in thickness from approximately 10 to 30 feet.

The lower glacial sediment is a gray, fine to medium sand with varying amounts of silt and occasional isolated silty clay lenses. This layer, situated just above bedrock, is encountered between 60 and 90 feet below ground surface and ranges from 15 to 40 feet thick.

Between the lower glacial sediment and the top of competent bedrock is a thin layer (up to several feet thick) of a very dense, variable color mixture of sand and gravel with significant amounts of clay and silt filling the coarse grain voids. Particles of coal can be found within this layer, which is noticeably denser than the overlying materials.

The bedrock beneath the Site consists of Paleozoic Age sedimentary rock on the order of 10,000 feet thick. The bedrock surface beneath the Site is fairly flat with a slope of approximately 0.5 to 0.7 percent toward the northwest. The bedrock is predominantly light to dark shale with occasional thin layers of coal or limestone. The shale is thinly bedded, the coal and limestone layers are laminated, and all are moderately cemented.

## 2.2 SITE HYDROGEOLOGY

Groundwater at the Site exists in both the unconsolidated glacial deposits and in bedrock. Due to the vertical thickness and lithologic characteristics of the sediments, four monitoring intervals were identified. The intervals were designated as the A/B-, C-, D-, and E-units. The A/B- through D-units are monitoring intervals within the unconsolidated materials, and the E-unit is the monitoring interval within the uppermost portion of bedrock. These units correspond to the various geologic units identified above, as summarized in the following table:



Geologic Description	Reference Nomenclature	Comments
Glacial Uppermost Sediments	A/B-unit	The A-unit refers to the upper portion of the glacial deposit, including the water table and the unsaturated unit. The B-unit refers to the lower portion of the glacial deposit. The A- and B-units are considered one hydrogeologic unit (the A/B-unit) based on their similar nature and degree of interaction.
Shallow (Upper) Glacial Sediments	C-unit	The C-unit includes the massive silty clay layer.
Lower Glacial Sediments	D-unit	The D-unit includes a dense sand layer in addition to a sand and gravel layer and a weathered shale/residual soil layer.
Bedrock	E-unit	The E-unit is defined as competent bedrock.

The A/B-unit was originally designated as two separate units. However, review of historical information for the Site shows that, for the purposes of assessing groundwater movement and quality, the A- and B-units can be grouped into one hydrostratigraphic unit. Both units have similar water-transmitting properties and they are not separated by confining layers. Both units contain thin, discontinuous lenses of sand, although these lenses are more common in the B-unit but are not believed to significantly affect groundwater flow through the A/B-unit.

### 3.0 INTERIM GROUNDWATER MONITORING PROGRAM

FTS conducted the 2008 IGMP groundwater sampling events from February 3 through 7, 2008 and August 25 through 28, 2008. As further discussed below, due to flooding, certain wells were inaccessible during the February sampling event and were sampled in March 2008 after the floodwaters receded. In addition, one well (OW-202A) was resampled in December 2008 due to anomalous analytical results in the August 2008 sample.

The current IGMP includes gauging at all existing monitoring wells (currently 69), 9 piezometers, 6 temporary piezometers, 5 staff gauges and 2 DNAPL barrier trench sumps and sampling of 49 wells. Figure 1 shows all monitoring locations (i.e., wells, piezometers, trench sumps, and surface water gauges). Table 1 identifies which monitoring locations were gauged and sampled during each 2008 semi-annual monitoring event. The following changes to the IGMP occurred in 2008:

- In June 2008, well OW-003E was removed from the sampling program but will continue to be gauged during subsequent events. This change was proposed in an August 11, 2005 letter to USEPA, and approved by USEPA in a letter dated February 6, 2006.
- In August 2008, wells OW-206A and OW-207A were installed and added to the IGMP, both wells will be sampled and gauged during future IGMP monitoring events. These wells were added as proposed in a February 28, 2008 Work Plan, which was approved by the USEPA on June 12, 2008.

In February 2008, water levels were measured at 81 wells/piezometers and groundwater samples were collected from 44 wells (Table 1). Water-level measurements were also obtained at two DNAPL barrier trench sumps and five surface water gauges during the February 2008 event. Well OW-36C could not be gauged during the February 2008 event because the well was blocked by a piece of tubing. FTS was notified on March 15, 2008 that the obstruction had been removed from the well by the Site operator. Wells OW-41A, OW-41B, OW-205A and OW-205B could not be sampled during the February 2008 event because they were inaccessible due to flooding. These four wells were sampled once the flood waters at the Site receded: well OW-41B was sampled on March 4, 2008, well OW-41A was sampled on March 5, 2008, and wells OW-205A and OW-205B were sampled on March 10, 2008.

In August 2008, water levels were measured at 84 wells/piezometers and groundwater samples were collected from 49 wells (Table 1). Water-level measurements were



also obtained at two DNAPL barrier trench sumps and five surface water gauges during the August 2008 event. During the August 2008, wells OW-204A, OW-204B, OW-205B, and OW-207A were purged dry and samples were collected after the wells sufficiently recharged.

### 3.1 WELL GAUGING

At the beginning of each sampling event, FTS field technicians used an oil/water interface probe to gauge each well/piezometer for depth to water, depth to NAPL, and total well depth. If NAPL was detected, the technician confirmed its presence via a new, clear disposable bailer and, if applicable, measured its thickness. Prior to use at each well, the technician cleaned the oil-water interface probe using an Alconox™ solution and deionized water rinse. The disposable bailers were disposed of after a single use.

### 3.2 WELL PURGING

Low-flow purging methods were used during all 2008 sampling events, in accordance with the updated Standard Operating Procedures (SOP) document titled “Low Flow (Minimal Drawdown) Groundwater Sampling Procedures,” submitted to the USEPA on October 22, 2007. During the low-flow purging, groundwater was removed from each well using either a peristaltic pump or stainless steel Monsoon submersible pump, and disposable tubing. Field measurements of water quality parameters (pH, dissolved oxygen [DO], oxygen reduction potential [ORP], specific conductivity, temperature, and turbidity) were measured while purging each well, using a YSI 556 multi-parameter meter and a La Motte 2020e turbidity meter. Field measurements were taken every three to five minutes. The field technicians recorded field observations on the groundwater sampling forms. Purging continued until field measurements had stabilized (i.e., three consecutive readings were obtained within the following criteria):

- $\pm 0.1$  s.u. for pH;
- $\pm 10\%$  for DO;
- $\pm 10$  mv for ORP;
- $\pm 3\%$  for specific conductivity;
- $\pm 10\%$  for temperature; and,
- $\pm 10\%$  for turbidity.

The field technicians cleaned the submersible pumps using the following procedures. Each pump had its own set of dedicated buckets for cleaning.

- 1) Wash in Alconox™ soap and hot water
- 2) Rinse in hot water
- 3) Rinse again in hot water
- 4) Rinse in isopropanol
- 5) Rinse in deionized water

### 3.3 GROUNDWATER SAMPLING

After the wells were purged, the technicians collected the groundwater samples. For wells that were purged dry, they allowed the water levels to recover prior to sample collection. In accordance with the IGMP and low-flow sampling SOP, the FTS field crew collected groundwater samples using either a peristaltic pump or a submersible stainless steel Monsoon pump and disposable Teflon®-lined tubing. Samples collected for dissolved metals analysis were field-filtered using either a peristaltic pump or a stainless steel Monsoon pump equipped with a 0.45 micron filter and disposable Teflon®-lined tubing. The samples were analyzed for the following constituents by TestAmerica (Pittsburgh, Pennsylvania):

- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) (USEPA SW-846 Method 8021B).
- Polynuclear aromatic hydrocarbons (PAHs) and pentachlorophenol (USEPA SW-846 Method 8270C).
- Total recoverable phenolics (USEPA SW-846 Method 9066).
- Total and dissolved arsenic, chromium, and copper (USEPA SW-846 Method 6010B).
- Dioxins/Furans (USEPA SW-846 Method 8290) for wells OW-022BR, OW-035B, OW-102B, and OW-202A during the second semi-annual sampling event only.

### 3.4 MONITORING WELL INSPECTION

During the February 2008 event, a comprehensive well inspection was conducted, which included 67 wells, 9 piezometers, 6 temporary piezometers, and 5 staff gauges. Wells OW-39DR and OW-40D were unable to be completely inspected during the February 2008 event because the well pads were submerged due to flooding. The technicians observed that the majority of the monitoring wells associated with the IGMP were in good condition, with only minor well repairs required. These minor well repairs, performed during or soon after the February 2008 event, included



repairing small cracks in well pads with crack filler/caulking and replacing missing or broken well caps. A comprehensive well inspection will also be completed in conjunction with the 2009 first semi-annual monitoring event, and identified deficiencies will be addressed and repairs completed as necessary.

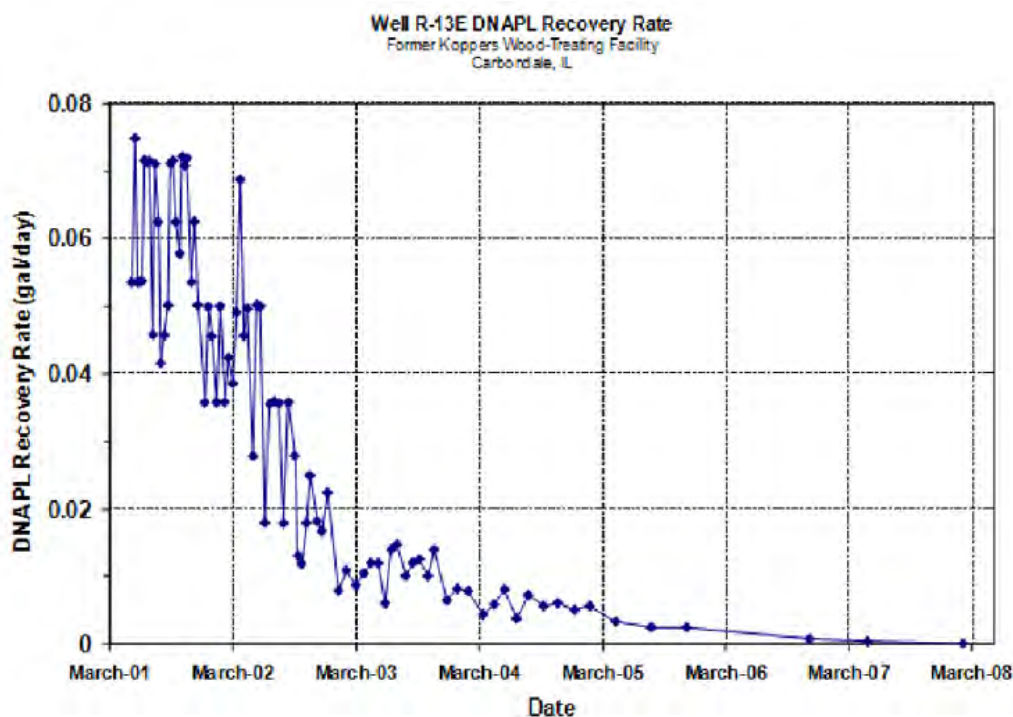


## 4.0 DNAPL DISTRIBUTION AND GROUNDWATER MIGRATION ASSESSMENT

### 4.1 NON-AQUEOUS PHASE LIQUIDS

As shown on Table 2, FTS observed DNAPL in four A/B-unit wells, one E unit well, and one DNAPL barrier trench sump. A measurable amount of DNAPL was found in well OB23-04B and the South Sump during the February 2008 event, and in wells OW-205B, R-008A, R-013E, and the South Sump during the August 2008 event. A trace amount of DNAPL was found in wells R-008A and R-013E during the February event, and in well P-8A during the August event. NAPL was not detected in any of the gauged C-unit or D-unit monitoring wells in either event.

Measured DNAPL thicknesses ranged from 0.43 feet (R-013E, August event) to 5.55 feet (OB23-04B, February event). In 2008, DNAPL levels in R-013E were gauged on a monthly basis. No DNAPL was removed from R-013E in 2008. The volume of DNAPL removed from R-013E has been decreasing over time, as depicted by the graph below.



DNAPL-recovery data from well R-13E showing an exponential decline in recovery rate.  
Graph provided by ARCADIS



Measurements of DNAPL thickness were also collected in wells R-008A and OW-205B throughout 2008. In well R-008A, DNAPL thicknesses ranged from 0.00 to 1.00 feet; no DNAPL was removed from R-008A in 2008. At well OW-205B, DNAPL thicknesses ranged from 0.00 to 1.88 feet in 2008. DNAPL was removed from well OW-205B on two occasions in 2008, resulting in a total recovered DNAPL volume of 1.0 gallon.

In late October 2005, Beazer initiated DNAPL recovery activities at recovery well RW-23, which is located in the former process area of the Site. Water is pumped from this well to increase the hydraulic gradient and draw DNAPL into the recovery well. DNAPL is pumped as it accumulates in the well. In 2008, approximately 769 gallons of DNAPL were recovered from RW-23. Approximately 1,550 gallons of DNAPL were also recovered from the south trench sump in 2008.

## 4.2 GROUNDWATER FLOW PATTERNS

FTS used the depth-to-groundwater measurements from the A/B-, C-, D-, and E-unit monitoring wells, piezometers and surface water gauges to calculate potentiometric surface elevations (Tables 3 and 4). These data were subsequently used to construct potentiometric surface maps and infer horizontal directions of groundwater flow in each of the monitored units. Figures 2 through 9 provide the potentiometric surface maps for each unit during each semi-annual event. The potentiometric contours and associated flow patterns for both monitoring events are discussed below for each of the four hydrogeologic units.

### 4.2.1. A/B-UNIT

Figures 2 and 3 show the A/B-unit potentiometric contours for the 2008 February and August sampling events, respectively. Because localized vertical gradients exist within the A/B-unit, some well data may appear to conflict with the drawn A/B-unit contours or data from adjacent wells. Professional judgment was used to draw the contours in these locations. As shown on Figures 2 and 3, groundwater was mounded near the south central portion of the Site in both February and August. The lateral extent of the drawdown cone developed by pumping at recovery well RW-23 (Figure 3) is expected to be small, given the low permeability of the A/B unit. Groundwater in this portion of the Site generally moves outward from the center of the mound.

In the eastern portion of the Site, groundwater generally moves toward Glade Creek, which represents a discharge boundary in the unit. Groundwater flow patterns were consistent with previous observations.



Historical groundwater and surface water elevation data indicate that Smith Ditch (a seasonal water body that flows to the north) changes between being a discharge and recharge feature for A/B-unit groundwater. In 2008, Smith Ditch appears to have been a gaining feature during the February and August events.

#### **4.2.2 C-UNIT**

Figures 4 and 5 show the C-unit potentiometric surfaces for the February and August 2008 sampling events, respectively. Because the C-unit acts as a confining unit between the A/B- and D-units, the direction of groundwater movement in the unit is predominantly vertical (downward); therefore, inferring groundwater flow directions from Figures 4 and 5 are not appropriate. The distributions of potentiometric head observed in the unit in 2008 are consistent with previous observations.

#### **4.2.3 D-UNIT**

Figures 6 and 7 show the D-unit potentiometric surface for the February and August 2008 sampling events, respectively. Throughout the Site, flow was generally to the north-northeast in both the February and August 2008 events. These groundwater elevations and flow patterns are consistent with previous observations.

#### **4.2.4 E-UNIT**

Figures 8 and 9 show the E-unit groundwater elevation contours for the February and August 2008 sampling events, respectively. During the February 2008 event, flow in the eastern portion of the Site was generally to the east-southeast. There was a groundwater mound in the south-central portion of the site, near OW-102E, during the February 2008 event. Groundwater in this area moves generally away from OW-102E, to the northwest and northeast. Groundwater elevations observed in February 2008 were generally lower than those observed in February 2007.

During the August 2008 event, flow in the eastern portion of the Site was generally to the east. Flow in the western portion of the Site was to the north-northeast. August 2008 groundwater elevations were generally higher than those observed in August 2007 in the E-unit. Historical data shows that there can be significant variations in the flow patterns for the E-unit.

### **4.3 GROUNDWATER MIGRATION ASSESSMENT**

FTS calculated the average horizontal groundwater linear flow velocities (Table 5) for each sampling event using the Darcy flow equation:



$$V_L = \frac{K * i}{n_e}$$

where:

$V_L$  = average linear groundwater flow velocity

$K$  = hydraulic conductivity

$i$  = average horizontal hydraulic gradient

$n_e$  = effective porosity

Horizontal gradients and linear groundwater velocities calculated using the 2008 groundwater elevation data for selected well pairs are summarized in Table 5. For February and August 2008, all of the average horizontal gradients (A/B-, C-, D-, and E-units) fall within the typical historical range as shown on Table 5.

It should be noted that constituent velocities will be less than the groundwater linear velocities presented in Table 5 because factors such as adsorption, dispersion, and biologic activity will retard the movement of dissolved constituents. Therefore, the groundwater linear velocity represents a conservatively high velocity when compared to constituent velocity.

#### 4.4 VERTICAL HYDRAULIC GRADIENT

Vertical hydraulic gradients calculated using the 2008 groundwater elevation data for selected well pairs are presented in Table 6. A positive number indicates a downward gradient whereas a negative number indicates an upward gradient. An upward vertical gradient suggests that the vertical component of the groundwater flow will be from the lower to upper monitored interval. This potentially limits downward vertical migration of constituents. Figure 10 shows the calculated vertical gradient directions between the A-, B-, and C-units and between the D- and E-units. The results are similar to the vertical gradients observed in 2007.

In the A/B-unit, groundwater flows downward and outward from the central portion of the Site (beneath the A/B-unit groundwater mound located near the former process area [Figures 2 and 3]), predominantly toward Glade Creek. Near Glade Creek, groundwater generally moves upward, discharging to the Creek as shown in the OW-044A/B well pair. In 2006 and 2008, Beazer installed additional wells closer to the new alignment of Glade Creek to monitor groundwater flow and constituent migration in this area.

The C-unit is an aquitard that is interpreted to separate the local groundwater flow system of the A/B-unit from a more regional flow system that includes the D- and E-units.



Groundwater flow in the D- and E-units is interpreted to be predominantly lateral beneath the Site. Vertical gradients between the D- and E-units vary spatially and seasonally and are likely controlled by spatial variability in hydraulic conductivity within the E-unit, and the degree of hydraulic communication between the D- and E-units.

## 5.0 GROUNDWATER QUALITY

TestAmerica analyzed the groundwater samples and FTS reviewed the resulting data for quality and completeness. Upon acceptance, FTS electronically transferred the data into a database for storage, reduction, and evaluation. Table 7 summarizes wells in which target analytes were detected during one or both of the 2008 groundwater monitoring events. Appendix A (Tables A-3 and A-4) presents a complete summary of the 2008 analytical results and compares the results to applicable IEPA Tiered Approach to Corrective Action Objectives (TACO) Tier I groundwater standards. In doing so, data from D- and E-Unit wells are compared to Class I standards and data from A/B- and C-Unit wells are compared to Class II standards. Table 8 summarizes data that exceeded applicable TACO groundwater standards for the first and second semi-annual 2008 groundwater sampling events. Table 9 summarizes data collected from wells: OW-041A, OW-41B, OW-205A, OW-205B, OW-206A, and OW-207A compared to the Illinois Water Quality Criteria (IWQC). Please note that the IWQC are not applicable to groundwater but comparison is being done as requested by USEPA. Table 10 presents the toxicity equivalent quotient (TEQ) summary for wells that were sampled for dioxins/furans during the second semi-annual sampling event (OW-022BR, OW-035B, OW-102B, and OW-202A).

Anomalous PAH and pentachlorophenol detections were found in the well OW-202A during the August sampling event. This well was re-sampled on December 11, 2008 for PAHs and pentachlorophenol only. All results from the December 2008 re-sampling of well OW-202A were non-detect. Both sets of data are presented in Table A-4, however, the December 2008 data only is presented in Tables 7 and 8. The reason for the anomalous results detected in August 2008 for well OW-202A is unknown; Beazer will continue to monitor this well during future sampling events.

### 5.1 FIELD MEASUREMENTS

The final field measurements collected during sampling are summarized in Appendix A (Tables A-1 and A-2). Field-measured specific conductivity, temperature, and pH data for 2008 are similar to those measured historically.

Of all the wells that were sampled in 2008, fourteen wells had pH readings in excess of 8.5 SU in at least one of the 2008 events (OW-027A, OW-036B, OW-102B OW-202B, OW-204B, OW-035DR, OW-037D, OW-102D, OW-202D, R-014D, OW-027E, OW-035E, OW-201E, and R-014E). This is an increase from the nine wells with >8.5 SU pH readings in the 2007 measurements.

In the 2008 events, one well had a pH reading below 6.0 SU (OW-202A). This is inconsistent with historical results; none of the wells have had pH below 6.0 SU since 2005.



## 5.2 POLYNUCLEAR AROMATIC HYDROCARBONS

In accordance with the IGMP, TestAmerica analyzed the groundwater samples for 16 PAHs using USEPA SW-846 Method 8270C. The suite of PAHs consists of:

acenaphthene	benzo(g,h,i)perylene	fluorene
acenaphthylene	benzo(k)fluoranthene	indeno(1,2,3-cd)pyrene
anthracene	chrysene	naphthalene
benzo(a)anthracene	dibenzo(a,h)anthracene	phenanthrene
benzo(a)pyrene	fluoranthene	pyrene
benzo(b)fluoranthene		

Table 7 lists the wells with PAH detections and the range of total PAH detections for 2008. These results are similar to previous data in that low-level PAH detections appear sporadically in most wells.

As indicated in Table 8, one or more PAH concentrations in groundwater samples from wells OW-205A and OW-205B exceeded TACO Class II groundwater standards in both the first and second semi-annual 2008 events. In addition, the August 2008 sample from OW-033E marginally exceeded the TACO Class I groundwater standards for benzo(a)anthracene and benzo(b)fluoranthene. PAH results for all other wells/events were below the applicable TACO groundwater standards.

## 5.3 PENTACHLOROPHENOL

Each groundwater sample was analyzed for pentachlorophenol using USEPA SW-846 Method 8270C. Table 7 shows there was one detection in the August event (OW-206A) and Table 8 shows there were no exceedances of the applicable TACO groundwater standards for pentachlorophenol. The pentachlorophenol results for 2008 are consistent with historical data, as low-level pentachlorophenol detections only appear sporadically in some Site wells.

## 5.4 VOLATILE ORGANIC COMPOUNDS

Groundwater samples were analyzed for benzene, toluene, ethylbenzene and xylenes (BTEX) using USEPA SW-846 Method 8021B. There were detections of BTEX in wells OW-205A and OW-205B in both events as shown in Table 7; however, there were no exceedances of the applicable TACO groundwater standards, as shown in Table 8.

## 5.5 METALS

Each IGMP groundwater sample was analyzed for total (unfiltered) and dissolved (filtered) arsenic, chromium, and copper by USEPA SW-846 Method 6010B. As





presented in Table 8, dissolved arsenic in well OW-026A during the August 2008 event is the only metal that exceeded an applicable TACO standard. All other detections were below the applicable TACO groundwater standards. This is consistent with historical data.

## 5.6 TOTAL RECOVERABLE PHENOLICS

Groundwater samples were analyzed for total recoverable phenolics using USEPA SW-846 Method 9066. Table 7 lists the wells with detections and the range of results. Total recoverable phenolics were detected in samples from both 2008 events. The total recoverable phenolics results for the 2008 sampling events are similar to those reported historically, in that low-level total recoverable phenolics detections appear to be sporadic occurrences. There are no TACO Tier I groundwater standards for total recoverable phenolics.

## 5.7 DIOXIN/FURAN

Although not part of the IGMP, groundwater samples collected from wells OW-022BR, OW-035B, OW-102B, and OW-202A were analyzed for dioxins/furans using USEPA SW-846 Method 8290 at the request of the USEPA during a July 16, 2008 meeting. Table 10 shows the detected concentrations of dioxins and furans with their calculated toxicity equivalent quotient (TEQ) concentration. The TEQ concentration is calculated by multiplying the concentration of each dioxin or furan by its respective toxicity equivalent factor (TEF). The resulting TEQ concentrations are then summed for each sample to determine the total TEQ. Dioxins/furans were detected in three out of the four wells (OW-035B, OW-102B, and OW-202A) during the second semi-annual 2008 event. Well OW-022BR was non-detect for dioxins/furans (Table 10). The dioxin/furan data were previously reported to the USEPA on October 31, 2008. As agreed upon with the USEPA, a second round of dioxin/furan sampling at these wells was completed in February 2009, and will be reported to the USEPA upon receipt of the laboratory analytical data.

## 5.8 DATA QUALITY

Field and laboratory data quality control measures were implemented as required by the IGMP. All of the necessary data qualifiers were added to the Site database and are present in the data summary tables provided in Appendix A (Tables A-3 and A-4). Data Evaluation Reports are included in Appendix B. While some qualifiers were added to the data, none of the data was rejected based on evaluation of the quality control data.



## 6.0 CONCLUSIONS AND CHANGES TO THE INTERIM GROUNDWATER MONITORING PROGRAM

Beazer has evaluated the 2008 IGMP data and reached the following conclusions:

- The 2008 groundwater flow directions and velocities for each monitored interval were similar to those reported historically, with the exceptions detailed in Section 4.
- Free-phase liquid (DNAPL) was present in only six of the 91 Site monitoring points (OB23-04B, OW-205B, R-008A, P-8A, R-013E, and the South Sump).
- Of the 49 wells sampled, only six show consistent detections of metals, and only thirteen show consistent detections of one or more organic constituents.

Beazer submitted a draft long-term, post-remediation GMP to the USEPA on November 16, 2007. Beazer and the USEPA discussed the draft GMP during a July 2008 meeting, and a revised draft GMP was submitted to the USEPA on October 6, 2008, which is currently being reviewed by the USEPA. The GMP proposes several modifications to the current IGMP, and will be implemented following approval by the USEPA. In the interim, groundwater monitoring will continue to be performed under the IGMP.



## TABLES

**Table 1**  
**Summary of IGMP Program**  
**2008 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**



Well Identification	2008 First Semi-Annual Event		2008 Second Semi-Annual Event	
	Gauged	Sampled	Gauged	Sampled
<b>DNAPL Barrier Trench Sumps</b>				
North Sump	X	---	X	---
South Sump	X	---	X	---
<b>Surface Water Gauges</b>				
GC-1	X	---	X	---
GC-2	X	---	X	---
Pond-1	X	---	X	---
Pond-2	X	---	X	---
Smith-1	X	---	X	---
<b>A-Unit</b>				
OW-003A	X	---	X	---
OW-017A	X	X	X	X
OW-026A	X	X	X	X
OW-027A	X	X	X	X
OW-031A	X	X	X	X
OW-041A <sup>(a)</sup>	X	X	X	X
OW-044A	X	---	X	---
OW-202A	X	X	X	X
OW-203A	X	X	X	X
OW-204A	X	X	X	X
OW-205A <sup>(a)</sup>	X	X	X	X
OW-206A <sup>(b)</sup>	---	---	X	X
OW-207A <sup>(b)</sup>	---	---	X	X
P-2	X	---	X	---
P-3	X	---	X	---
P-4A	X	---	X	---
P-6A	X	---	X	---
P-7A	X	---	X	---
P-8A	X	---	X	---
R-008A	X	---	X	---
R-013A	X	X	X	X
TP-5A	X	---	X	---
TP-11A	X	---	X	---
TP-12A	X	---	X	---
TP-13A	X	---	X	---
TP-14A	X	---	X	---
TP-15A	X	---	X	---
<b>B-Unit</b>				
OB23-04B	X	---	X	---
OW-010B	X	X	X	X
OW-022BR	X	X	X	X
OW-035B	X	X	X	X
OW-036B	X	X	X	X
OW-037B	X	X	X	X
OW-039BR2	X	X	X	X
OW-040B	X	X	X	X
OW-041B <sup>(a)</sup>	X	X	X	X
OW-042B	X	X	X	X
OW-043B	X	---	X	---
OW-044B	X	---	X	---
OW-102B	X	X	X	X
OW-202B	X	X	X	X
OW-204B	X	X	X	X
OW-205B <sup>(a)</sup>	X	X	X	X
P-5B	X	---	X	---
P-6B	X	---	X	---
P-7B	X	---	X	---
S-003B	X	---	X	---

**Table 1**  
**Summary of IGMP Program**  
**2008 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**



Well Identification	2008 First Semi-Annual Event		2008 Second Semi-Annual Event	
	Gauged	Sampled	Gauged	Sampled
<b>C-Unit</b>				
OW-017C	X	X	X	X
OW-023C	X	X	X	X
OW-027C	X	---	X	---
OW-035C	X	X	X	X
OW-036C <sup>(c)</sup>	NM	---	X	---
R-013C	X	---	X	---
R-014C	X	X	X	X
<b>D-Unit</b>				
A-008D	X	---	X	---
OW-010D	X	---	X	---
OW-012D	X	X	X	X
OW-017D	X	---	X	---
OW-023D	X	X	X	X
OW-027D	X	X	X	X
OW-035DR	X	X	X	X
OW-036D	X	---	X	---
OW-037D	X	X	X	X
OW-039DR	X	X	X	X
OW-040D	X	X	X	X
OW-041D	X	X	X	X
OW-042DR	X	---	X	---
OW-044D	X	X	X	X
OW-102D	X	X	X	X
OW-202D	X	X	X	X
R-013D	X	---	X	---
R-014D	X	X	X	X
<b>E-Unit</b>				
A-008E	X	---	X	---
OW-003E <sup>(d)</sup>	X	X	X	---
OW-012E	X	---	X	---
OW-027E	X	X	X	X
OW-033E	X	X	X	X
OW-035E	X	X	X	X
OW-039ER	X	X	X	X
OW-102E	X	X	X	X
OW-200E	X	X	X	X
OW-201E	X	X	X	X
R-013E	X	---	X	---
R-014E	X	X	X	X
<b>Total</b>	<b>88</b>	<b>48</b>	<b>91</b>	<b>49</b>

**Notes:**

"X" indicates field applies to that well

"---" indicates field does not apply to that well

"NM" indicates well was not gauged

"NS" indicates well was not sampled

<sup>(a)</sup> Wells OW-41A, OW-205A, OW-41B, and OW-205B could not be sampled during the February 2008 event because they were submerged due to flooding. These wells were sampled in March 2008.

<sup>(b)</sup> Wells OW-206A and OW-207A were installed in August 2008 and were added to the monitoring program during the August 2008 event.

<sup>(c)</sup> Well OW-036C could not be gauged during the February 2008 event because the well was blocked.

<sup>(d)</sup> Well OW-003E was removed from the sampling program in June 2008. This well will continue to be gauged during subsequent events.

**Table 2**  
**Summary of 2008 DNAPL Thickness Measurements**  
**2008 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

Well Identification	First Semi-Annual (February 4, 2008)			Second Semi-Annual (August 25, 2008)		
	Depth to DNAPL (Feet TOC)	Total Well Depth (Feet TOC)	DNAPL Thickness (Feet)	Depth to DNAPL (Feet TOC)	Total Well Depth (Feet TOC)	DNAPL Thickness (Feet)
P-8A	ND	ND	ND	18.19	18.19	Trace
R-008A	16.73	16.73	Trace	15.69	16.50	0.81 <sup>a</sup>
OB23-04B	46.40	51.95	5.55	ND	ND	ND
OW-205B	ND	ND	ND	30.55	31.80	1.25
R-013E	134.90	134.90	Trace	134.60	135.03	0.43
South Sump	49.10	51.30	2.20	49.10	51.30	2.20

**Notes:**

ND - DNAPL not detected

NM - Not Measured

feet TOC - feet below top of casing

**Table 3**  
**Summary of Groundwater Elevations**  
**February 3-4, 2008**  
**2008 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

Well	Gauging Date	Top of Casing Elevation (Feet msl)	Top of Screen Elevation (Feet msl)	Bottom of Screen Elevation (Feet msl)	Depth to Groundwater (Feet TOC)	Groundwater Elevation (Feet msl)
<b>DNAPL Barrier Trench Sumps</b>						
North Sump	04-Feb-08	378.67	NA	NA	7.95	370.72
South Sump	04-Feb-08	377.01	NA	NA	6.75	370.26
<b>Surface Water Gauges</b>						
Pond-1	04-Feb-08	373.89	NA	NA	3.96	369.93
Pond-2	04-Feb-08	372.59	NA	NA	2.10	370.49
GC-1	04-Feb-08	369.81	NA	NA	2.30	367.51
GC-2	04-Feb-08	365.71	NA	NA	2.38	363.33
Smith-1	04-Feb-08	388.90	NA	NA	4.13	384.77
<b>A-Unit</b>						
OW-003A	04-Feb-08	380.36	372.58	362.58	4.21	376.15
OW-017A	03-Feb-08	393.93	385.80	375.80	9.55	384.38
OW-026A	04-Feb-08	399.56	382.00	372.00	9.09	390.47
OW-027A	03-Feb-08	391.69	383.00	373.00	5.33	386.36
OW-031A	04-Feb-08	399.00	388.80	378.80	5.53	393.47
OW-041A	03-Feb-08	375.52	368.02	358.02	6.59	368.93
OW-044A	03-Feb-08	378.35	362.10	352.10	7.03	371.32
OW-202A	03-Feb-08	394.73	NA	NA	2.59	392.14
OW-203A	03-Feb-08	376.89	369.39	359.39	8.57	368.32
OW-204A	03-Feb-08	380.64	373.14	363.14	11.57	369.07
OW-205A	04-Feb-08	372.80	360.30	350.30	4.56	368.24
P-2	03-Feb-08	373.65	NA	NA	4.97	368.68
P-3	03-Feb-08	372.69	NA	NA	7.31	365.38
P-4A	03-Feb-08	376.64	369.14	359.14	7.68	368.96
P-6A	03-Feb-08	376.58	369.09	359.08	8.74	367.84
P-7A	04-Feb-08	377.84	370.34	360.34	6.58	371.26
P-8A	04-Feb-08	377.49	370.00	360.00	6.99	370.50
TP-5A	04-Feb-08	381.81	372.01	362.01	13.03	368.78
TP-11A	04-Feb-08	375.58	365.68	355.68	3.69	371.89
TP-12A	04-Feb-08	374.04	369.04	359.04	4.53	369.51
TP-13A	04-Feb-08	375.85	370.95	360.95	4.56	371.29
TP-14A	04-Feb-08	372.25	367.25	357.25	3.14	369.11
TP-15A	04-Feb-08	372.82	367.72	357.72	3.46	369.36
R-008A	04-Feb-08	387.89	381.10	371.10	2.17	385.72
R-013A	03-Feb-08	387.68	379.92	369.92	4.64	383.04
<b>B-Unit</b>						
OB23-04B	04-Feb-08	401.34	361.41	351.41	15.40	385.94
OW-010B	04-Feb-08	381.47	344.00	334.00	7.95	373.52
OW-022BR	04-Feb-08	395.97	361.24	351.24	4.31	391.66
OW-035B	04-Feb-08	399.35	371.50	361.50	5.46	393.89
OW-036B	04-Feb-08	396.78	360.90	350.90	13.90	382.88
OW-037B	03-Feb-08	394.74	361.20	351.20	3.77	390.97
OW-039BR2	03-Feb-08	382.69	365.19	355.19	15.02	367.67
OW-040B	03-Feb-08	377.91	342.20	332.20	10.93	366.98
OW-041B	03-Feb-08	375.16	333.90	323.90	5.85	369.31
OW-042B	04-Feb-08	388.68	357.65	347.65	4.06	384.62
OW-043B	04-Feb-08	394.38	363.90	353.90	8.30	386.08
OW-044B	03-Feb-08	378.78	342.10	332.10	7.40	371.38
OW-102B	04-Feb-08	397.19	364.00	354.00	5.10	392.09
OW-202B	04-Feb-08	395.26	NA	NA	7.10	388.16
OW-204B	03-Feb-08	381.04	363.54	353.54	11.34	369.70
OW-205B	04-Feb-08	373.37	350.87	340.87	6.29	367.08
P-5B	03-Feb-08	382.05	361.55	351.55	13.75	368.30
P-6B	03-Feb-08	376.51	359.01	349.01	8.49	368.02
P-7B	04-Feb-08	377.63	360.13	350.13	6.58	371.05
S-003B	03-Feb-08	392.19	362.30	352.30	5.35	386.84

**Table 3**  
**Summary of Groundwater Elevations**  
**February 3-4, 2008**  
**2008 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

Well	Gauging Date	Top of Casing Elevation (Feet msl)	Top of Screen Elevation (Feet msl)	Bottom of Screen Elevation (Feet msl)	Depth to Groundwater (Feet TOC)	Groundwater Elevation (Feet msl)
<b>C-Unit</b>						
OW-017C	03-Feb-08	393.31	322.91	312.91	19.45	373.86
OW-023C	03-Feb-08	401.43	313.97	303.97	27.58	373.85
OW-027C	03-Feb-08	391.14	320.53	310.53	16.77	374.37
OW-035C	03-Feb-08	400.02	313.30	303.30	26.11	373.91
OW-036C <sup>(a)</sup>	03-Feb-08	396.93	311.27	301.27	NM	NM
R-013C	03-Feb-08	388.58	321.23	311.23	14.90	373.68
R-014C	03-Feb-08	393.35	321.30	311.30	18.99	374.36
<b>D-Unit</b>						
A-008D	03-Feb-08	388.71	279.30	269.30	15.17	373.54
OW-010D	03-Feb-08	382.19	296.58	286.58	10.05	372.14
OW-012D	03-Feb-08	395.82	286.70	276.70	22.66	373.16
OW-017D	03-Feb-08	394.08	291.05	281.05	20.45	373.63
OW-023D	03-Feb-08	401.42	287.81	272.81	27.68	373.74
OW-027D	03-Feb-08	391.40	278.53	268.53	17.83	373.57
OW-035DR	03-Feb-08	399.32	280.84	270.84	25.43	373.89
OW-036D	03-Feb-08	397.28	287.71	277.71	24.81	372.47
OW-037D	03-Feb-08	395.07	281.57	271.57	21.31	373.76
OW-039DR	04-Feb-08	381.85	284.35	274.35	10.18	371.67
OW-040D	03-Feb-08	377.68	291.40	281.40	5.84	371.84
OW-041D	03-Feb-08	376.68	294.10	284.10	4.66	372.02
OW-042DR	03-Feb-08	390.45	280.30	270.30	16.82	373.63
OW-044D	03-Feb-08	379.01	283.80	273.80	7.20	371.81
OW-102D	03-Feb-08	396.85	288.80	278.80	22.96	373.89
OW-202D	04-Feb-08	395.10	NA	NA	20.45	374.65
R-013D	03-Feb-08	387.03	280.91	270.91	13.56	373.47
R-014D	04-Feb-08	393.44	276.90	266.90	19.90	373.54
<b>E-Unit</b>						
A-008E	03-Feb-08	388.61	255.90	245.90	15.45	373.16
OW-003E	03-Feb-08	378.10	270.16	260.16	5.87	372.23
OW-012E	03-Feb-08	395.76	262.71	252.71	22.25	373.51
OW-027E	04-Feb-08	390.98	263.46	253.46	17.79	373.19
OW-033E	03-Feb-08	398.77	265.50	255.50	25.40	373.37
OW-035E	03-Feb-08	399.19	265.81	255.81	25.56	373.63
OW-039ER	04-Feb-08	382.04	261.54	251.54	9.54	372.50
OW-102E	03-Feb-08	396.91	264.80	254.80	22.69	374.22
OW-200E	04-Feb-08	387.47	262.89	252.89	14.15	373.32
OW-201E	04-Feb-08	389.69	264.30	254.30	16.06	373.63
R-013E	04-Feb-08	387.22	262.24	252.24	13.74	373.48
R-014E	03-Feb-08	392.87	259.46	249.46	19.15	373.72

**Notes:**

Feet msl - feet above mean sea level

Feet TOC - feet below top of casing

NA - not applicable or not available

NM - not measured or could not be located

<sup>(a)</sup> OW-36C could not be gauged due to a blockage in the well.

**Table 4**  
**Summary of Groundwater Elevations**  
**August 25, 2008**  
**2008 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

Well	Gauging Date	Top of Casing Elevation (Feet msl)	Top of Screen Elevation (Feet msl)	Bottom of Screen Elevation (Feet msl)	Depth to Groundwater (Feet TOC)	Groundwater Elevation (Feet msl)
<b>DNAPL Barrier Trench Sumps</b>						
North Sump	25-Aug-08	378.67	NA	NA	8.04	370.63
South Sump	25-Aug-08	377.01	NA	NA	6.82	370.19
<b>Surface Water Gauges</b>						
Pond-1	25-Aug-08	373.89	NA	NA	4.12	369.77
Pond-2	25-Aug-08	372.59	NA	NA	2.48	370.11
GC-1	25-Aug-08	369.81	NA	NA	2.60	367.21
GC-2	25-Aug-08	365.71	NA	NA	2.69	363.02
Smith-1	25-Aug-08	388.90	NA	NA	4.12	384.78
<b>A-Unit</b>						
OW-003A	25-Aug-08	380.36	372.58	362.58	5.01	375.35
OW-017A	25-Aug-08	393.93	385.80	375.80	11.77	382.16
OW-026A	25-Aug-08	399.56	382.00	372.00	5.50	394.06
OW-027A	25-Aug-08	391.69	383.00	373.00	7.51	384.18
OW-031A	25-Aug-08	399.00	388.80	378.80	6.02	392.98
OW-041A	25-Aug-08	375.52	368.02	358.02	5.21	370.31
OW-044A	25-Aug-08	378.35	362.10	352.10	7.31	371.04
OW-202A	25-Aug-08	394.73	NA	NA	4.14	390.59
OW-203A	25-Aug-08	376.89	369.39	359.39	8.03	368.86
OW-204A	25-Aug-08	380.64	373.14	363.14	9.40	371.24
OW-205A	25-Aug-08	372.80	360.30	350.30	4.63	368.17
OW-206A	25-Aug-08	368.62	NA	NA	6.44	362.18
OW-207A	25-Aug-08	371.91	NA	NA	12.97	358.94
P-2	25-Aug-08	373.65	NA	NA	7.40	366.25
P-3	25-Aug-08	372.69	NA	NA	7.65	365.04
P-4A	25-Aug-08	376.64	369.14	359.14	5.58	371.06
P-6A	25-Aug-08	376.58	369.09	359.08	8.10	368.48
P-7A	25-Aug-08	377.84	370.34	360.34	5.87	371.97
P-8A	25-Aug-08	377.49	370.00	360.00	5.62	371.87
TP-5A	25-Aug-08	381.81	372.01	362.01	12.59	369.22
TP-11A	25-Aug-08	375.58	365.68	355.68	4.66	370.92
TP-12A	25-Aug-08	374.04	369.04	359.04	5.57	368.47
TP-13A	25-Aug-08	375.85	370.95	360.95	4.89	370.96
TP-14A	25-Aug-08	372.25	367.25	357.25	4.19	368.06
TP-15A	25-Aug-08	372.82	367.72	357.72	4.72	368.10
R-008A	25-Aug-08	387.89	381.10	371.10	5.57	382.32
R-013A	25-Aug-08	387.68	379.92	369.92	5.26	382.42
<b>B-Unit</b>						
OB23-04B	25-Aug-08	401.34	361.41	351.41	16.51	384.83
OW-010B	25-Aug-08	381.47	344.00	334.00	10.11	371.36
OW-022BR	25-Aug-08	395.97	361.24	351.24	4.59	391.38
OW-035B	25-Aug-08	399.35	371.50	361.50	9.92	389.43
OW-036B	25-Aug-08	396.78	360.90	350.90	14.28	382.50
OW-037B	25-Aug-08	394.74	361.20	351.20	4.85	389.89
OW-039BR2	25-Aug-08	382.69	365.19	355.19	14.60	368.09
OW-040B	25-Aug-08	377.91	342.20	332.20	9.98	367.93
OW-041B	25-Aug-08	375.16	333.90	323.90	6.00	369.16
OW-042B	25-Aug-08	388.68	357.65	347.65	5.02	383.66
OW-043B	25-Aug-08	394.38	363.90	353.90	9.70	384.68
OW-044B	25-Aug-08	378.78	342.10	332.10	7.19	371.59
OW-102B	25-Aug-08	397.19	364.00	354.00	6.97	390.22
OW-202B	25-Aug-08	395.26	NA	NA	9.04	386.22
OW-204B	25-Aug-08	381.04	363.54	353.54	12.33	368.71
OW-205B	25-Aug-08	373.37	350.87	340.87	6.19	367.18
P-5B	25-Aug-08	382.05	361.55	351.55	13.50	368.55
P-6B	25-Aug-08	376.51	359.01	349.01	8.02	368.49
P-7B	25-Aug-08	377.63	360.13	350.13	5.31	372.32
S-003B	25-Aug-08	392.19	362.30	352.30	5.15	387.04



**Table 4**  
**Summary of Groundwater Elevations**  
**August 25, 2008**  
**2008 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

Well	Gauging Date	Top of Casing Elevation (Feet msl)	Top of Screen Elevation (Feet msl)	Bottom of Screen Elevation (Feet msl)	Depth to Groundwater (Feet TOC)	Groundwater Elevation (Feet msl)
<b>C-Unit</b>						
OW-017C	25-Aug-08	393.31	322.91	312.91	16.91	376.40
OW-023C	25-Aug-08	401.43	313.97	303.97	25.15	376.28
OW-027C	25-Aug-08	391.14	320.53	310.53	14.69	376.45
OW-035C	25-Aug-08	400.02	313.30	303.30	23.90	376.12
OW-036C	25-Aug-08	396.93	311.27	301.27	21.47	375.46
R-013C	25-Aug-08	388.58	321.23	311.23	12.72	375.86
R-014C	25-Aug-08	393.35	321.30	311.30	16.69	376.66
<b>D-Unit</b>						
A-008D	25-Aug-08	388.71	279.30	269.30	13.00	375.71
OW-010D	25-Aug-08	382.19	296.58	286.58	8.40	373.79
OW-012D	25-Aug-08	395.82	286.70	276.70	20.58	375.24
OW-017D	25-Aug-08	394.08	291.05	281.05	18.22	375.86
OW-023D	25-Aug-08	401.42	287.81	272.81	25.46	375.96
OW-027D	25-Aug-08	391.40	278.53	268.53	15.65	375.75
OW-035DR	25-Aug-08	399.32	280.84	270.84	23.27	376.05
OW-036D	25-Aug-08	397.28	287.71	277.71	23.10	374.18
OW-037D	25-Aug-08	395.07	281.57	271.57	18.93	376.14
OW-039DR	25-Aug-08	381.85	284.35	274.35	8.71	373.14
OW-040D	25-Aug-08	377.68	291.40	281.40	4.02	373.66
OW-041D	25-Aug-08	376.68	294.10	284.10	18.02	358.66
OW-042DR	25-Aug-08	390.45	280.30	270.30	14.66	375.79
OW-044D	25-Aug-08	379.01	283.80	273.80	5.70	373.31
OW-102D	25-Aug-08	396.85	288.80	278.80	20.74	376.11
OW-202D	25-Aug-08	395.10	NA	NA	18.04	377.06
R-013D	25-Aug-08	387.03	280.91	270.91	11.38	375.65
R-014D	25-Aug-08	393.44	276.90	266.90	17.68	375.76
<b>E-Unit</b>						
A-008E	25-Aug-08	388.61	255.90	245.90	13.20	375.41
OW-003E	25-Aug-08	378.10	270.16	260.16	4.02	374.08
OW-012E	25-Aug-08	395.76	262.71	252.71	20.05	375.71
OW-027E	25-Aug-08	390.98	263.46	253.46	14.38	376.60
OW-033E	25-Aug-08	398.77	265.50	255.50	23.02	375.75
OW-035E	25-Aug-08	399.19	265.81	255.81	23.33	375.86
OW-039ER	25-Aug-08	382.04	261.54	251.54	7.98	374.06
OW-102E	25-Aug-08	396.91	264.80	254.80	20.66	376.25
OW-200E	25-Aug-08	387.47	262.89	252.89	12.11	375.36
OW-201E	25-Aug-08	389.69	264.30	254.30	13.85	375.84
R-013E	25-Aug-08	387.22	262.24	252.24	11.35	375.87
R-014E	25-Aug-08	392.87	259.46	249.46	17.62	375.25

**Notes:**

Feet msl - feet above mean sea level

Feet TOC - feet below top of casing

NA - not applicable or not available

NM - not measured or could not be located



**Table 5**  
**2008 Average Horizontal Groundwater Flow Velocities**  
**2008 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

First Semi-Annual (February 3-4, 2008)					Second Semi-Annual (August 25, 2008)					
Well Pair	Horizontal Distance (feet)	Elevation Difference (feet)	Hydraulic Gradient (feet/feet)	Linear Flow Velocity (feet/day)	Well Pair	Horizontal Distance (feet)	Elevation Difference (feet)	Hydraulic Gradient (feet/feet)	Linear Flow Velocity (feet/day)	
<b>A/B-Unit</b> -- k=7.92E-7 ft/sec (6.8E-02 ft/day), n <sub>e</sub> = 0.10, V <sub>L</sub> = 3.8 E-3 to 1.45E-2 ft/day Typical historical hydraulic gradient: 0.004 to 0.020 ft/ft										
S-003B to OW-042B	305	2.22	0.0073	4.9E-03	OW-017A to OW-003A	1040	6.81	0.0065	4.5E-03	
OW-017A to OW-003A	1040	8.23	0.0079	5.4E-03	OW-031A to OW-042B	660	9.32	0.0141	9.6E-03	
Average				0.0076	Average				0.0103	7.0E-03
<b>C-Unit</b> -- k=4.58E-8 ft/sec (3.95E-03 ft/day), n <sub>e</sub> = 0.05, V <sub>L</sub> = 8.24E-5 to 2.19E-4 ft/day Typical historical hydraulic gradient: 0.002 to 0.003 ft/ft										
R-014C to R-013C	240	0.68	0.0028	2.2E-04	R-014C to R-013C	240	0.80	0.0033	2.6E-04	
OW-035C to OW-017C	685	0.05	0.000073	5.8E-06	OW-017C to OW-035C	685	0.28	0.00041	3.2E-05	
Average				0.00145	Average				0.0019	1.5E-04
<b>D-Unit</b> -- k=1.85E-05 ft/sec (1.6 ft/day), n <sub>e</sub> = 0.20, V <sub>L</sub> = 6.5E-3 to 1.97E-2 ft/day Typical historical hydraulic gradient: 0.001 to 0.003 ft/ft										
OW-202D to OW-037D	1446	0.89	0.0006	4.9E-03	OW-202D to OW-037D	1446	0.92	0.0006	5.1E-03	
OW-017D to OW-010D	1247	1.49	0.0012	9.6E-03	OW-017D to OW-010D	1247	2.07	0.0017	1.3E-02	
Average				0.0009	Average				0.0011	9.2E-03
<b>E-Unit</b> -- k=5.33E-06 ft/sec (4.61E-01 ft/day), n <sub>e</sub> = 0.05, V <sub>L</sub> = 8.57E-3 to 1.7E-2 ft/day Typical historical hydraulic gradient: 0.002 to 0.004 ft/ft										
OW-102E to OW-033E	532	0.85	0.0016	1.5E-02	OW-012E to OW-003E	497	2.15	0.0043	4.0E-02	
OW-012E to OW-003E	497	1.28	0.0026	2.4E-02	OW-102E to OW-035E	940	1.68	0.0018	1.6E-02	
Average				0.0021	Average				0.0031	2.8E-02

**Notes:**

$$v = (k * i) / n_e$$

Where:

$v$  = velocity

$k$  = hydraulic conductivity

$i$  = hydraulic gradient

$n_e$  = effective porosity

$V_L$  = typical linear flow velocity of Unit

**Table 6**  
**2008 Vertical Hydraulic Gradients at Selected Well Clusters**  
**2008 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

Well Cluster	Vertical Gradient (feet/feet)	
	First Semi-Annual	Second Semi-Annual
<b>A- and B-Unit to C-Unit</b>		
OW-017A TO OW-017C	1.7E-01	9.2E-02
OW-027A TO OW-027C	1.9E-01	1.2E-01
OW-035B TO OW-035C	3.4E-01	2.3E-01
OW-036B TO OW-036C	NA	1.4E-01
OW-044A TO OW-044B	-3.0E-01	-2.8E-02
R-013A TO R-013C	1.6E-01	1.1E-01
<b>D-Unit to E-Unit</b>		
A-008D TO A-008E	1.6E-02	1.3E-02
OW-012D TO OW-012E	-1.5E-02	-2.0E-02
OW-027D TO OW-027E	2.5E-02	-5.6E-02
OW-035DR TO OW-035E	1.7E-02	1.3E-02
OW-102D TO OW-102E	-1.4E-02	-5.8E-03
R-013D TO R-013E	-5.4E-02	-1.2E-02
R-014D TO R-014E	-1.0E-02	2.9E-02

**Notes:**

Positive values indicate a downward vertical gradient.

Negative values indicate an upward vertical gradient.

The vertical gradient is calculated using the following equation:

$$i_v = (GWE_{\text{shallow}} - GWE_{\text{deep}}) / (Mp_{\text{shallow}} - Mp_{\text{deep}})$$

where:

$i_v$  = vertical gradient

$GWE_{\text{shallow}}$  = groundwater elevation of the shallow well

$GWE_{\text{deep}}$  = groundwater elevation of the deep well

$Mp_{\text{shallow}}$  = elevation of the midpoint of the shallow well screen

$Mp_{\text{deep}}$  = elevation of the midpoint of the deep well screen

**Table 7**  
**2008 Summary of Wells with Detections**  
**2008 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**



Constituent	Wells Detected				Lowest Detected Concentration (sample, event)	Highest Detected Concentration (sample, event)
	First Semi-Annual		Second Semi-Annual			
Total PAHs <sup>(a)</sup>	OW-010B OW-026A OW-035E OW-040D OW-041A OW-041B OW-041B-DUP OW-102E	OW-200E OW-203A OW-204A OW-205A OW-205B R-013A R-013A-DUP R-014E	OW-010B OW-012D OW-017A OW-017C OW-022BR OW-023C OW-026A OW-027A OW-027D OW-027E OW-031A OW-033E OW-035B OW-035DR OW-035E OW-036B OW-037B OW-037D OW-039BR2 OW-039DR OW-040B OW-040D	OW-041A OW-041B OW-042B OW-044D OW-102B OW-102D OW-102E OW-102E DUP OW-200E OW-201E OW-201E DUP OW-202B OW-203A OW-204A OW-205A OW-205B OW-206A OW-207A R-013A R-014D R-014D DUP R-014E	0.141 (OW-102B, 2nd)	6877 (OW-205B, 2nd)
Pentachlorophenol	None		OW-206A		0.087 (OW-206A, 2nd)	0.087 (OW-206A, 2nd)
BTEX <sup>(b)</sup>	OW-205A	OW-205B	OW-205A	OW-205B	41.3 (OW-205A, 1st)	58 (OW-205B, 2nd)
Arsenic (Dissolved)	OW-017C OW-023C OW-026A OW-035C OW-039BR-DUP OW-041B	OW-041B-DUP OW-041D OW-102D OW-202D R-014C R-014C-DUP	OW-101B OW-012D OW-017C OW-017C DUP OW-023C OW-026A OW-027A OW-027D OW-035C	OW-037B OW-041B OW-041D OW-044D OW-202D OW-205A R-014C R-014D R-014D DUP	2.5 (OW-012D, OW-044D) (2nd)	240 (OW-026A, 2nd)
Arsenic (Total)	OW-017C OW-023C OW-026A OW-035C OW-039BR-DUP OW-041B OW-041B-DUP	OW-041D OW-102D OW-102D-DUP OW-202D R-014C R-014C-DUP	OW-010B OW-012D OW-017C OW-017C DUP OW-023C OW-026A OW-027A OW-027D OW-035C OW-039BR2	OW-041A OW-041B OW-041D OW-102E OW-102E DUP OW-202D OW-205A OW-206A OW-207A R-014C	2.4 (OW-102E DUP, 2nd)	287 (OW-026A, 2nd)
Chromium (Dissolved)	OW-203A OW-204A	OW-204B	OW-010B OW-026A OW-027A OW-039BR2 OW-040D OW-042B	OW-102D OW-203A OW-204B OW-205A R-013A	1.7 (OW-010B, OW-205A) (R-013A, 2nd)	110 (OW-204B, 1st)

**Table 7**  
**2008 Summary of Wells with Detections**  
**2008 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**



Constituent	Wells Detected				Lowest Detected Concentration (sample, event)	Highest Detected Concentration (sample, event)
	First Semi-Annual		Second Semi-Annual			
Chromium (Total)	OW-010B OW-022BR OW-023D OW-033E OW-037B OW-041A OW-044D	OW-102B OW-203A OW-204A OW-204B R-013A R-014C R-014C-DUP	OW-101B OW-012D OW-017A OW-017C OW-017C DUP OW-022BR OW-023C OW-023D OW-026A OW-027A OW-027D OW-027E OW-033E OW-035C OW-035E OW-036B OW-037B OW-037D OW-039BR2 OW-039ER OW-040D OW-041A	OW-041B OW-041D OW-042B OW-044D OW-102B OW-102D OW-102E OW-102E DUP OW-200E OW-201E OW-201E DUP OW-202A OW-202B OW-203A OW-204A OW-204B OW-205A OW-206A OW-207A R-013A R-014C	1.7 (R-014E, 2nd)	1290 (OW-204A, 1st)
Copper (Dissolved)	None		OW-040D OW-201E DUP OW-203A	OW-206A OW-207A R-014E	0.9 (OW-201E DUP, 2nd)	33.6 (OW-207A, 2nd)
Copper (Total)	OW-041A	OW-204A	OW-017A OW-022BR OW-023C OW-023D OW-035B OW-035E OW-036B OW-039BR2 OW-040B OW-040D OW-041A	OW-044D OW-102D OW-200E OW-201E OW-201E DUP OW-202A OW-203A OW-206A OW-207A R-014E	0.88 (OW-023C, 2nd)	1720 (OW-207A, 2nd)
Total Recoverable Phenolics	OW-003E OW-010B OW-017C OW-022BR OW-023C OW-026A OW-027A OW-027E OW-031A OW-033E OW-035B OW-035C OW-035DR OW-035E OW-036B OW-039BR OW-039BR-DUP OW-039DR OW-039DR-DUP OW-040B OW-041B	OW-041B-DUP OW-041D OW-042B OW-044D OW-102B OW-102D OW-102D-DUP OW-102E OW-201E OW-202A OW-202B OW-202D OW-204A OW-204B OW-205A OW-205B R-013A R-013A-DUP R-014C R-014C-DUP R-014D	OW-010B OW-017C OW-017C DUP OW-022BR OW-023C OW-023D OW-026A OW-027A OW-027E OW-035C OW-035DR OW-035E OW-041B OW-041D	OW-102D OW-102E OW-102E DUP OW-200E OW-201E OW-201E DUP OW-202A OW-202D OW-205A OW-205B R-013A R-013C R-014D DUP	0.0057 (OW-041B, 2nd)	0.089 (OW-R-013A DUP, 1st)

**Notes:**
<sup>(a)</sup> Wells in which at least one PAH compound was detected. Concentrations listed are total PAHs.

<sup>(b)</sup> Wells in which at least one BTEX compound was detected. Concentrations listed are total BTEX.

**Table 8**  
**Summary of TACO Tier 1 Exceedances**  
**First and Second Semi-Annual 2008 Sampling Events**  
**2008 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility - Carbondale, Illinois**

Well	Parameter	Sample Result (ug/L)	TACO Class I (D- and E-Unit Wells)	TACO Class II (A/B and C-Unit Wells)
<b>First Semi-Annual Sampling Event</b>				
<b>TACO Tier 1 Exceedance</b>				
OW-205A	Naphthalene	1600		220
OW-205B	Naphthalene	1500		220
<b>Second Semi-Annual Sampling Event</b>				
<b>TACO Tier 1 Exceedance</b>				
OW-026A	Arsenic, dissolved	240		200
OW-033E	Benzo(a)anthracene Benzo(b)fluoranthene	0.31 B 0.42 B	0.13 0.13	
OW-205A	Naphthalene	3700		220
OW-205B	Benzo(a)anthracene Chrysene Naphthalene	65 54 4600		0.65 7.5 220

**Notes:**

TACO (Tiered Approach to Corrective Action Objectives, IEPA) Tier 1 Standards are different for Class I (D and E unit wells) and Class II (A/B and C unit wells).

**Table 9**  
**Summary of Analytical Data Compared to the IWQC**  
**First and Second Semi-Annual 2008 Sampling Events**  
**2008 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

ANALYTE	UNITS	IWQC <sup>1,2</sup>		OW-041A 3/5/2008	OW-041A 8/28/2008	OW-041B 3/4/2008	OW-041B - DUP	OW-041B 8/28/2008	OW-205A 3/10/2008	OW-205A 8/26/2008	OW-205B 3/10/2008	OW-205B 9/16/2008	OW-206A 8/28/2008	OW-207A 9/16/2008
		Aquatic Life	Human Health											
Metals (Method 6010B)														
ARSENIC - SOLUBLE	UG/L	190	--	10 U	10.0 U	71 J	49.7 J	67	10 U	4.2 J	10 U	NA	10.0 U	10 U
ARSENIC - TOTAL	UG/L	--	--	10 U	4.7 J	27.4 J	39.8 J	76.7	10 U	3.3 J	10 U	NA	9.8 J	27.9
CHROMIUM - SOLUBLE	UG/L	--	--	5 U	5.0 U	5 U	5 U	5.0 U	5 U	1.7 J	5 U	NA	5.0 U	5 U
CHROMIUM - TOTAL	UG/L	--	--	326	216	5 U	5 U	4.9 J	5 U	1.3 J	5 U	NA	84.2	269
COPPER - SOLUBLE	UG/L	--	--	25 U	3 U	25 U	25 U	1.2 U	25 U	25.0 U	25 U	NA	8.6 J	33.6
COPPER - TOTAL	UG/L	--	--	27.9	39.2	25 U	25 U	4.6 U	25 U	25.0 U	25 U	NA	83.4	1720
BTEX (Method 8021B)														
BENZENE	UG/L	860	310	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	7.3	7.5	7.1	50 U	1.0 U	1 U
ETHYLBENZENE	UG/L	14	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	19	30	20	50 U	1.0 U	1 U
TOLUENE	UG/L	600	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3	3.6	4.3	50 U	1.0 U	1 U
TOTAL XYLENES	UG/L	360	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	12	1.07	26	58	1.0 U	1 U
SVOCs (Method 8270C SIM)														
PENTACHLOROPHENOL	UG/L	13	2.5	0.94 U	0.95 U	0.94 U	0.94 U	0.95 U	240 U	240 U	240 U	240 U	0.087 J	0.94 U
SVOCs (Method 8270C SIM)														
ACENAPHTHENE	UG/L	62	--	0.19 U	0.19 U	0.23 B	0.19 U	0.056 J	47 U	150	61	420	0.35	0.22
ACENAPHTHYLENE	UG/L	15	--	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	47 U	48 U	47 U	48 U	0.15 J	0.19 U
ANTHRACENE	UG/L	0.53	35,000	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	47 U	48 U	47 U	68	0.32	0.19 U
BENZO(A)ANTHRACENE	UG/L	--	0.16	0.12 U	0.038 J	0.12 U	0.12 U	0.12 U	31 U	31 U	31 U	65	0.17	0.12 U
BENZO(A)PYRENE	UG/L	--	0.016	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	47 U	48 U	47 U	48 U	0.28	0.19 U
BENZO(B)FLUORANTHENE	UG/L	--	0.16	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	42 U	43 U	42 U	43 U	0.45	0.17 U
BENZO(GH)PERYLENE	UG/L	--	--	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	47 U	48 U	47 U	48 U	0.26	0.19 U
BENZO(K)FLUORANTHENE	UG/L	--	1.6	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	40 U	41 U	40 U	40 U	0.2	0.16 U
CHRYSENE	UG/L	--	16	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	47 U	48 U	47 U	54	0.25	0.19 U
DIBENZO(A,H)ANTHRACENE	UG/L	--	0.016	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	47 U	48 U	47 U	48 U	0.2 U	0.19 U
FLUORANTHENE	UG/L	1.8	120	0.24	0.052 J	0.19 U	0.19 U	0.038 J	47 U	48 U	47 U	330	0.35	0.24
FLUORENE	UG/L	16	4,500	0.19 U	0.058 J	0.23 B	0.19 U	0.061 J	47 U	79	47 U	280	0.24	0.2
INDENO(1,2,3-CD)PYRENE	UG/L	--	0.16	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	47 U	48 U	47 U	48 U	0.24	0.19 U
NAPHTHALENE	UG/L	140	--	0.19 U	0.19 U	0.19 U	0.19 U	0.098 J	1600	3700	1500	4600	0.36	0.19 U
PHENANTHRENE	UG/L	210	--	0.46 B	0.14 J	0.62 B	0.48 B	0.17 J	47 U	91	47 U	820	0.5	0.46
PYRENE	UG/L	--	3,500	0.19 U	0.042 J	0.19 U	0.19 U	0.028 J	47 U	48 U	47 U	240	0.37	0.19
Phenolics (Method 9066)														
PHENOLICS	MG/L	--	--	0.01 U	0.01 U	0.013	0.011	0.0057 JB	0.019	0.044	0.036	0.041	0.01 U	0.01 U

**Notes:**

IWQC - Illinois Water Quality Criteria  
 BTEX - benzene, toluene, ethylbenzene, xylenes  
 SVOCs - semivolatile organic compounds  
 U - compound was analyzed but not detected  
 J - an estimated result  
 DUP - Duplicate sample  
 B - field blank contamination  
 Bold - constituent detected  
 Shade ■ - indicates concentration exceeds IWQC (Illinois Water Quality Criteria)

- 1 - For metals and BTEX, Illinois Water Quality Criteria obtained from 35 IAC 302.208. For PAHs and pentachlorophenol, Illinois Water Quality Criteria obtained from the following table:  
<http://www.epa.sate.il.us/water/water-quality-standards/water-quality-criteria-list.pdf> Aquatic life criteria represent the lower of the Acute Aquatic (AATC) and the Chronic Aquatic Toxicity Criterion (CATC). Human health criteria represent the lower of the Human Threshold Criterion (HTC) and the Human Nonthreshold Criterion (HNC).
- 2 - IWQC are not applicable to groundwater, but comparison being done as requested by USEPA.

Table 10  
TEQ Summary  
Toxic Equivalents of Detected Dioxin and/or Furans  
2008 Second Semi-Annual RCRA Groundwater Data  
2008 Annual RCRA Groundwater Monitoring Report  
Carbondale Facility, Carbondale, Illinois

ANALYTE NAME	UNITS	TEFs	OW-022BR 8/27/2008	OW-035B 8/26/2008	OW-102B 8/26/2008	OW-202A 8/25/2008	OW-202A- DUP
<b>Dioxins/Furans (Method 8290)</b>							
1,2,3,4,6,7,8-HPCDD	UG/L	0.01	0.000011 U	<b>0.00013</b>	0.0000034 U	<b>0.00007 J</b>	<b>0.00016 J</b>
1,2,3,4,6,7,8-HPCDF	UG/L	0.01	0.0000053 U	<b>0.000077</b>	0.0000012 U	<b>0.000032 J</b>	<b>0.000053 J</b>
1,2,3,4,7,8,9-HPCDF	UG/L	0.01	0.0000061 U	0.0000023 U	0.0000014 U	0.0000033 U	0.0000038 U
1,2,3,4,7,8-HXCDD	UG/L	0.1	0.0000093 U	0.0000016 U	0.0000012 U	0.0000025 U	0.0000027 U
1,2,3,4,7,8-HXCDF	UG/L	0.1	0.0000084 U	0.000018 U	0.00000058 U	0.0000039 U	0.0000037 U
1,2,3,6,7,8-HXCDD	UG/L	0.1	0.0000073 U	0.0000027 U	0.00000092 U	0.000002 U	0.0000043 U
1,2,3,6,7,8-HXCDF	UG/L	0.1	0.0000069 U	0.0000022 U	0.00000048 U	0.0000007 U	0.0000011 U
1,2,3,7,8,9-HXCDD	UG/L	0.1	0.0000077 U	0.0000018 U	0.00000092 U	0.000002 U	0.0000044 U
1,2,3,7,8,9-HXCDF	UG/L	0.1	0.0000092 U	0.00000082 U	0.00000066 U	0.00000095 U	0.0000014 U
1,2,3,7,8-PECDD	UG/L	1	0.000013 U	0.0000014 U	0.0000016 U	0.0000026 U	0.0000031 U
1,2,3,7,8-PECDF	UG/L	0.03	0.0000079 U	0.00000088 U	0.00000079 U	0.0000012 U	0.0000016 U
2,3,4,6,7,8-HXCDF	UG/L	0.1	0.0000082 U	0.0000016 U	0.00000056 U	0.00000081 U	0.0000012 U
2,3,4,7,8-PECDF	UG/L	0.3	0.0000082 U	0.0000014 U	0.00000077 U	0.0000012 U	0.0000015 U
2,3,7,8-TCDD	UG/L	1	0.0000054 U	0.00000093 U	0.00000098 U	0.0000015 U	0.0000023 U
2,3,7,8-TCDF	UG/L	0.1	0.0000043 U	0.0000014 U	0.000001 U	0.0000018 U	0.0000024 U
OCDD	UG/L	0.0003	0.000019 U	<b>0.002</b>	<b>0.000061 J</b>	<b>0.00069 J</b>	<b>0.0018 J</b>
OCDF	UG/L	0.0003	0.000017 U	<b>0.00019</b>	0.0000032 U	<b>0.00011 J</b>	<b>0.00021 J</b>
TOTAL HPCDD	UG/L	NA	0.000011 U	<b>0.00032</b>	0.0000034 U	<b>0.00015 J</b>	<b>0.00033 J</b>
TOTAL HPCDF	UG/L	NA	0.0000061 U	<b>0.00014</b>	0.0000014 U	<b>0.000093 J</b>	<b>0.0002 J</b>
TOTAL HXCDD	UG/L	NA	0.0000093 U	0.0000063 U	0.0000012 U	0.0000059 U	0.000014 U
TOTAL HXCDF	UG/L	NA	0.0000092 U	0.000018 U	0.00000066 U	0.0000064 U	<b>0.000027</b>
TOTAL PECDD	UG/L	NA	0.000013 U	0.0000014 U	0.0000016 U	0.0000026 U	0.0000031 U
TOTAL PECDF	UG/L	NA	0.0000082 U	0.0000014 U	0.0000011 U	0.0000016 U	0.000002 U
TOTAL TCDD	UG/L	NA	0.0000054 U	0.00000093 U	0.00000098 U	0.0000015 U	0.0000023 U
TOTAL TCDF	UG/L	NA	0.0000043 U	0.0000014 U	0.000001 U	0.0000018 U	0.0000024 U
TOTAL TEQ - ND = 0	UG/L	NA	0.00E+00	2.73E-06	1.83E-08	1.26E-06	2.73E-06

**Notes:**

U - compound was analyzed but not detected

J - estimated result

DUP - Duplicate sample

Bold - constituent detected

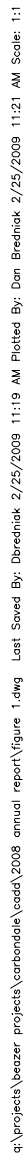
TEQ - Toxicity Equivalent Quotient

TEQs were calculated using zer for nondetect values

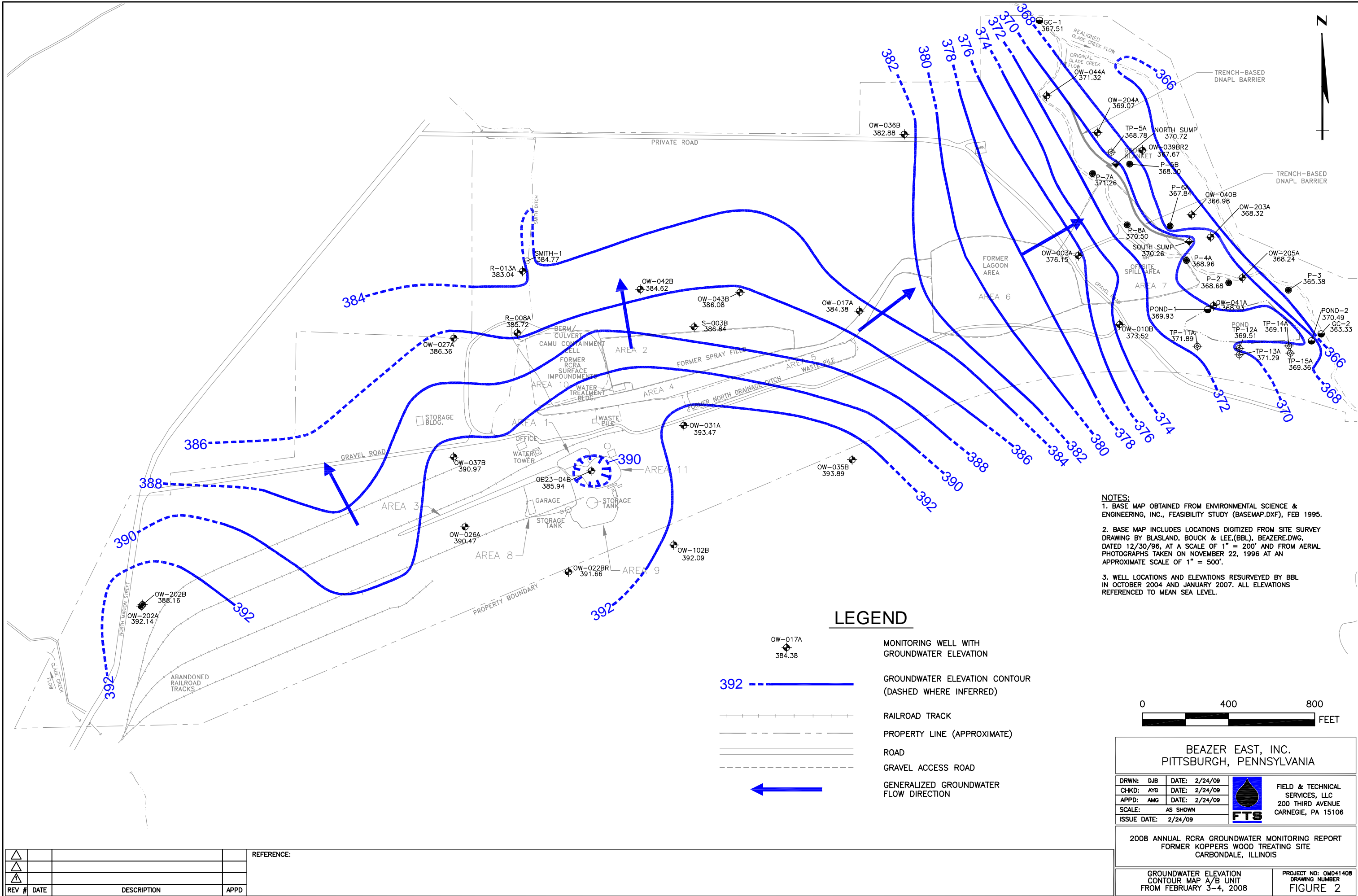
TEFs values taken from the 2005 World Health Organization Re-evaluation of Human and Mammalian Toxic  
Equivalency Factors for Dioxins and Dioxin-like Compounds



## FIGURES




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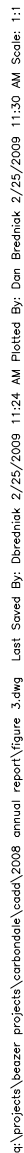
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BEAZER EAST, INC.  
PITTSBURGH, PENNSYLVANIA

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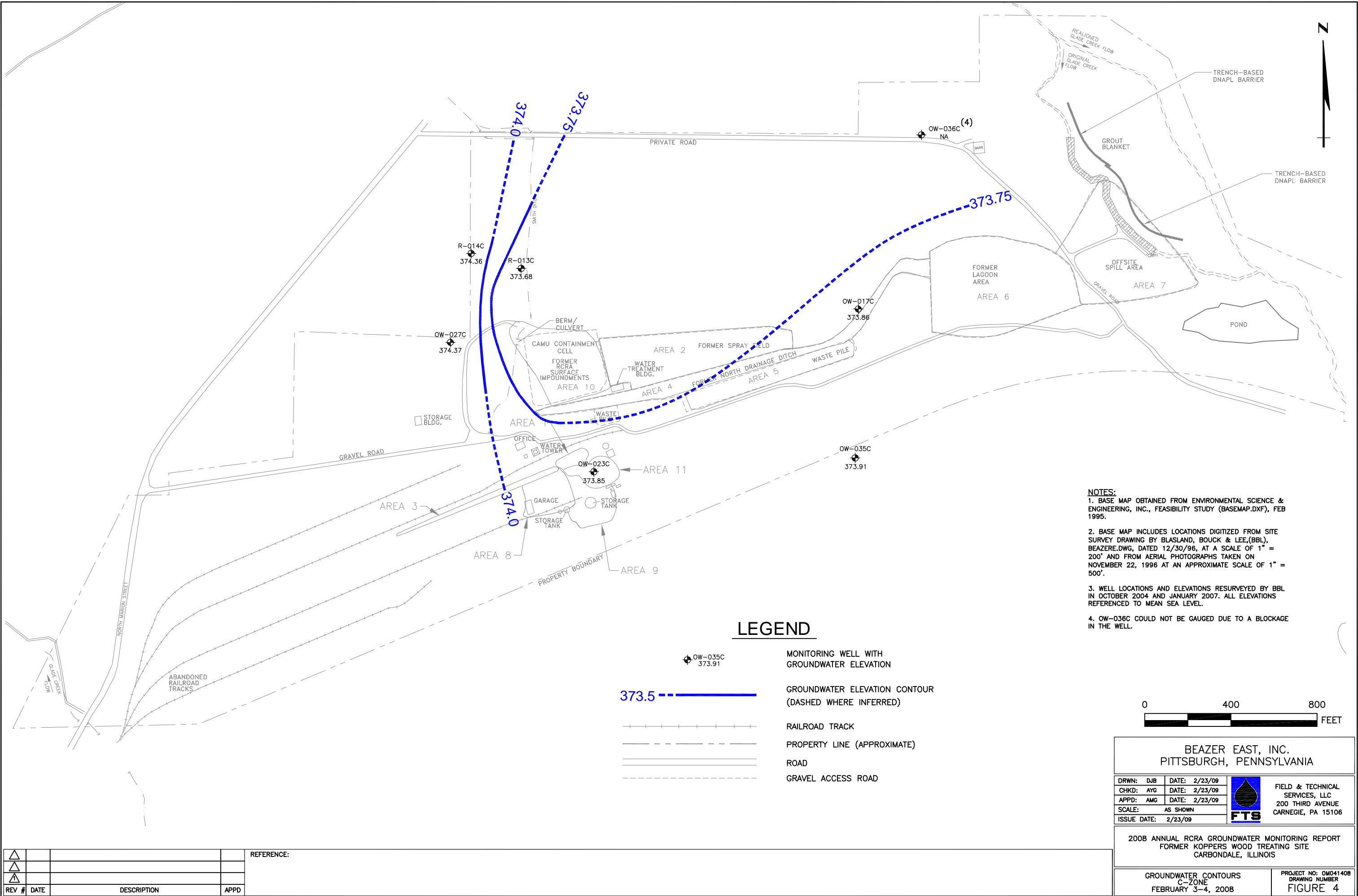
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FORMER KOPPERS WOOD TREATING SITE  
CARBONDALE, ILLINOIS

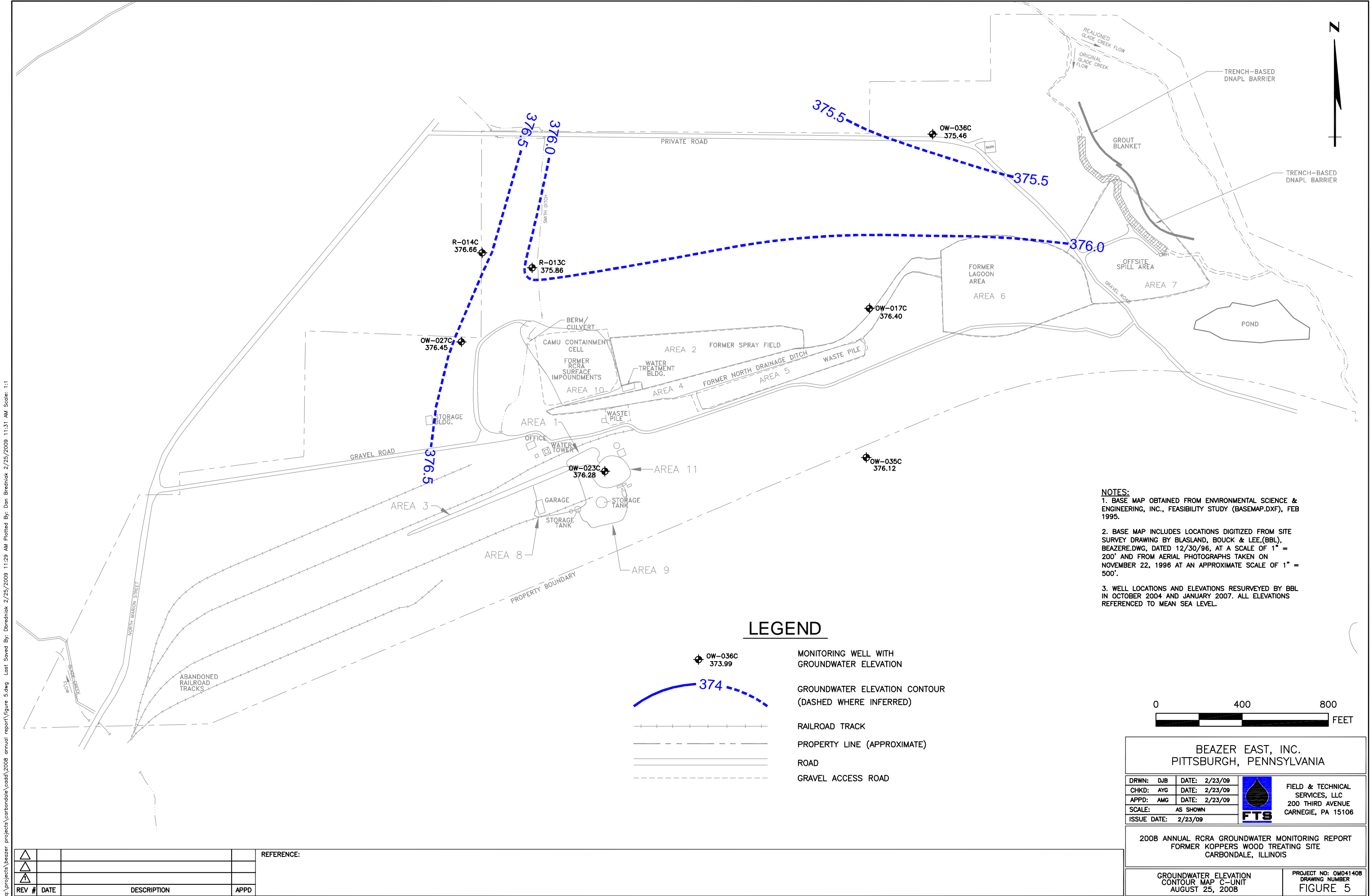
GROUNDWATER ELEVATION CONTOUR MAP A/B UNIT FROM FEBRUARY 3-4, 2008	PROJECT NO: 0M041408 DRAWING NUMBER FIGURE 2
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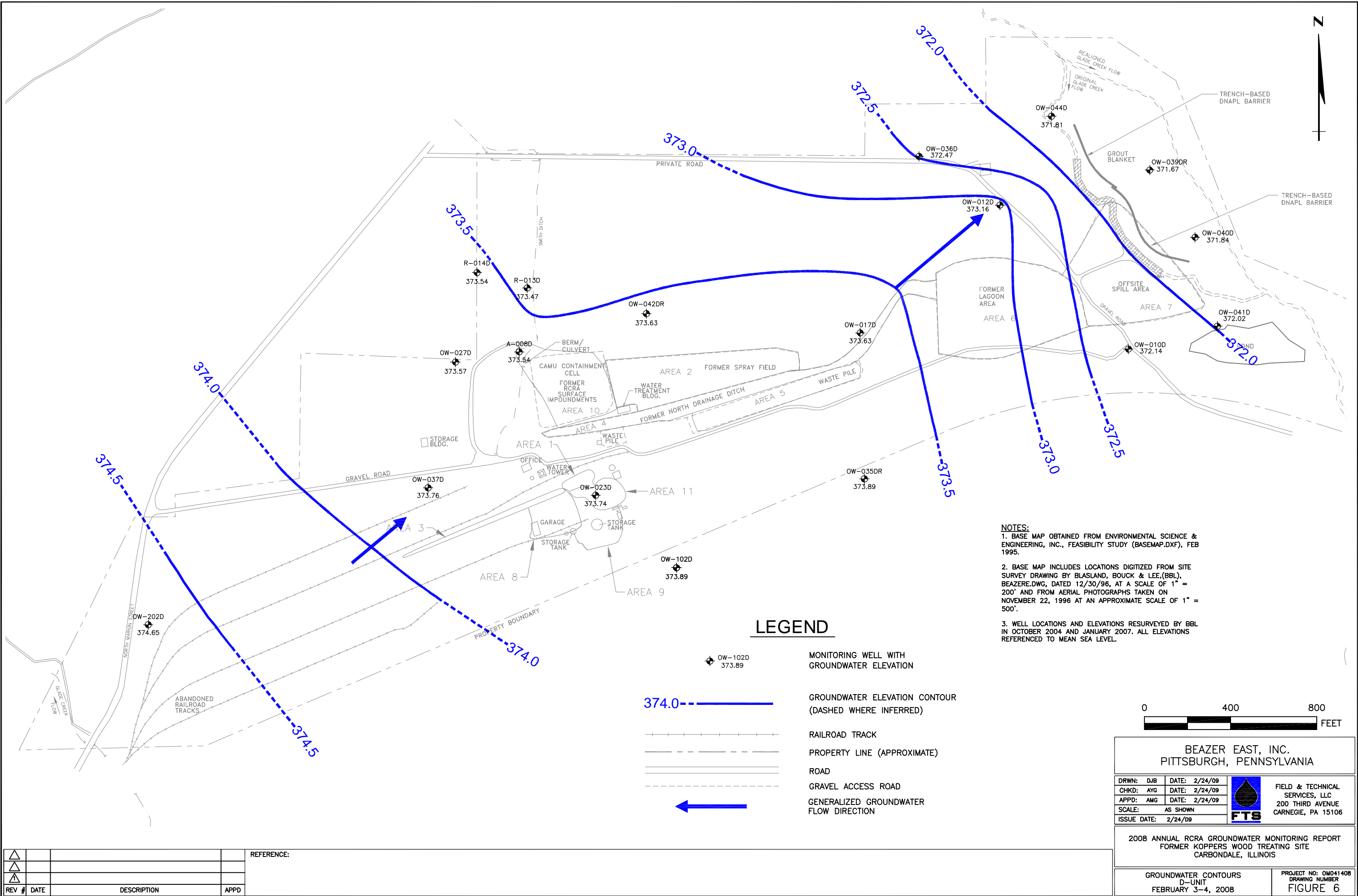
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PITTSBURGH, PENNSYLVANIA

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CHKD: AYG	DATE: 2/23/09		
APPD: AMG	DATE: 2/23/09		
SCALE: AS SHOWN			
ISSUE DATE: 2/23/09			

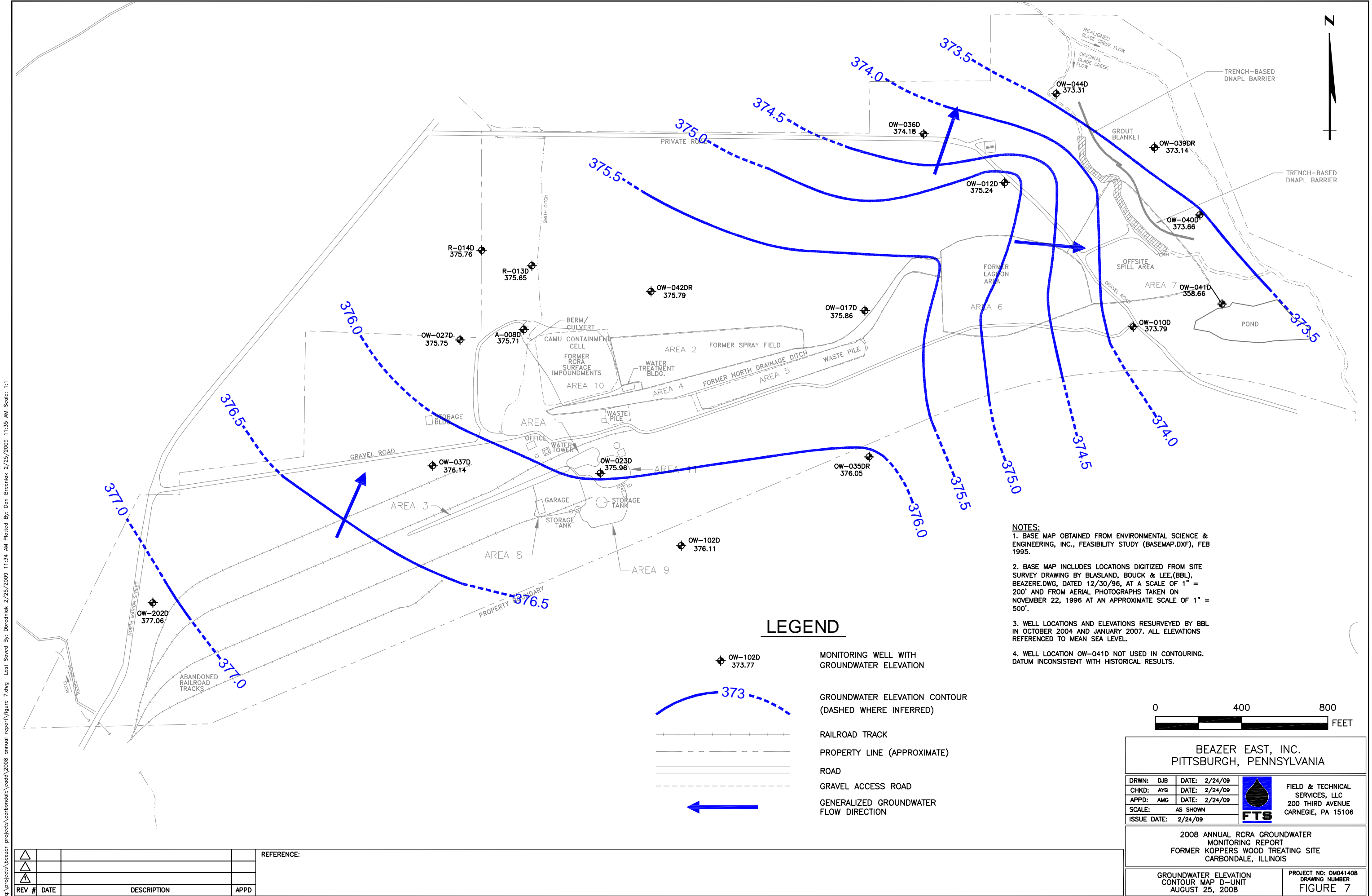
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FORMER KOPPERS WOOD TREATING SITE  
CARBONDALE, ILLINOIS

GROUNDWATER ELEVATION CONTOUR MAP C-UNIT AUGUST 25, 2008	PROJECT NO: 0M041408 DRAWING NUMBER FIGURE 5
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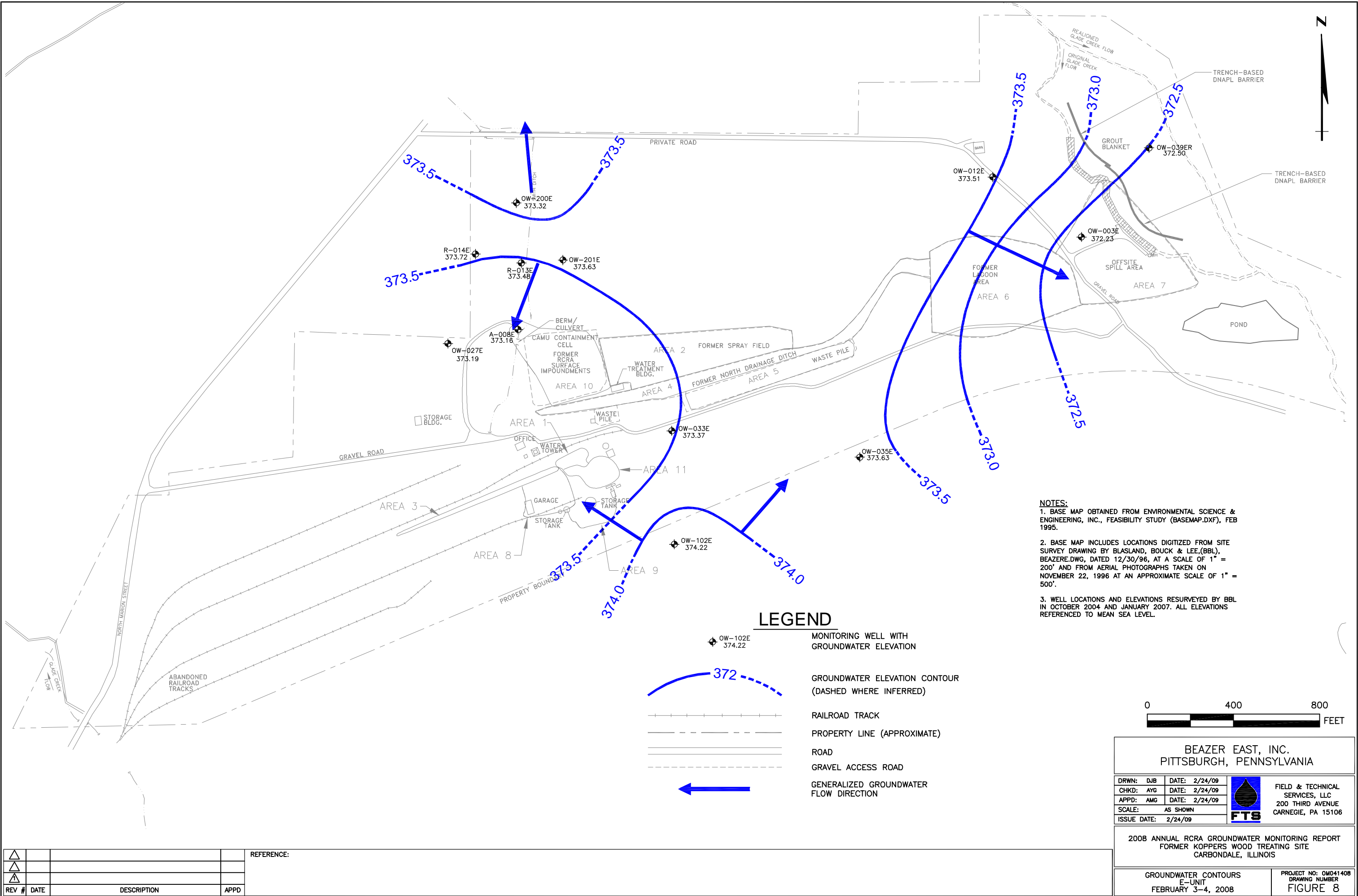
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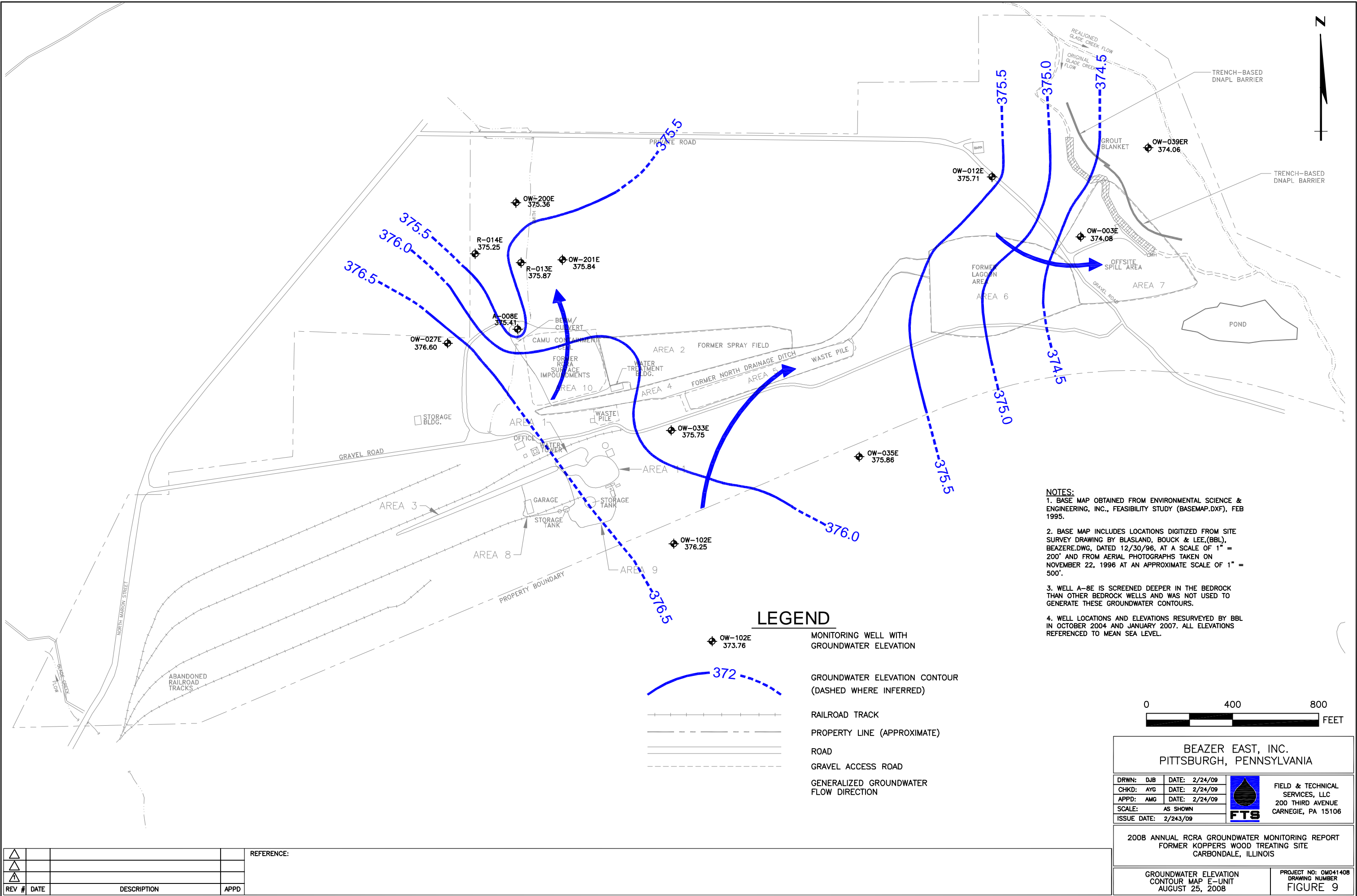
BEAZER EAST, INC.  
PITTSBURGH, PENNSYLVANIA

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CHKD: AYG	DATE: 2/24/09		
APPD: AMG	DATE: 2/24/09		
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ISSUE DATE: 2/24/09			

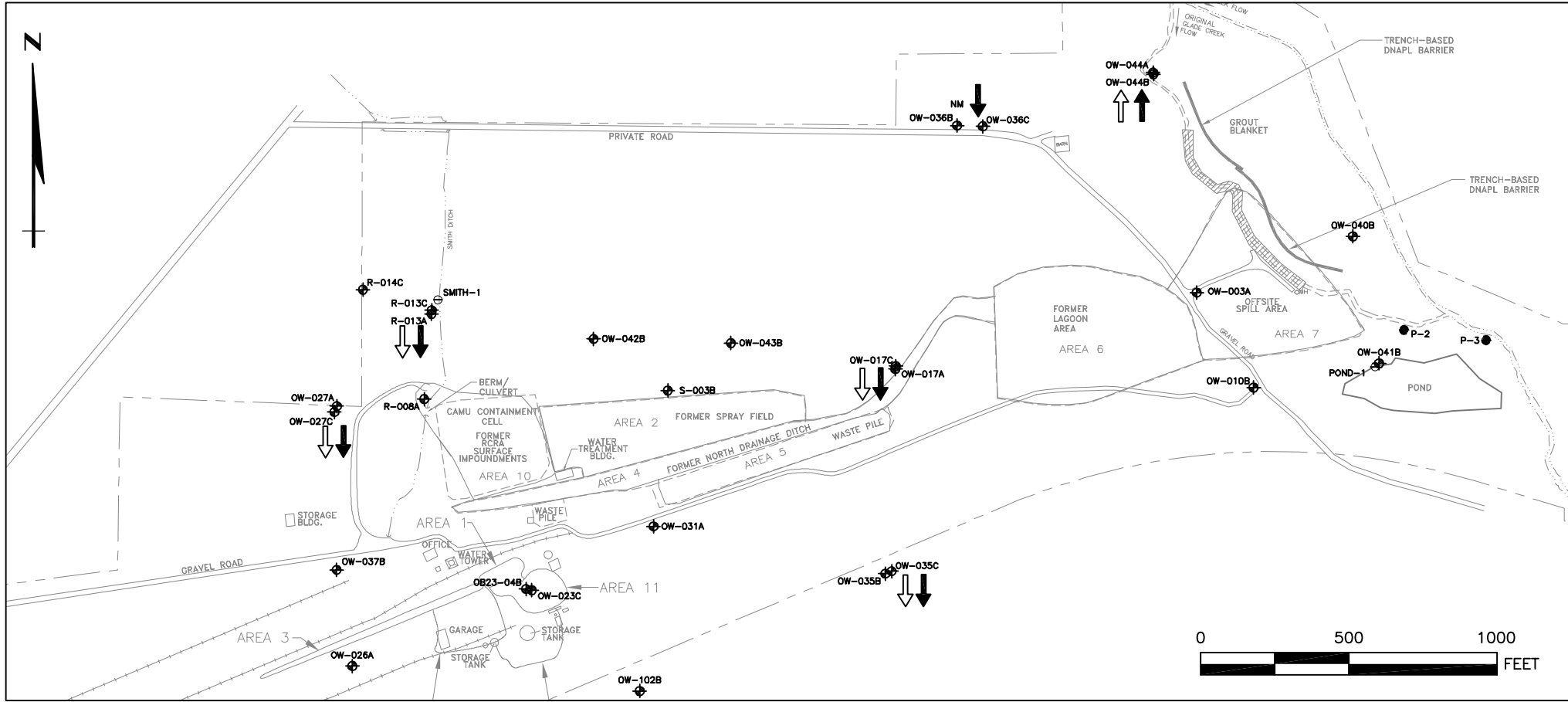
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FORMER KOPPERS WOOD TREATING SITE  
CARBONDALE, ILLINOIS

GROUNDWATER CONTOURS E-UNIT FEBRUARY 3-4, 2008	PROJECT NO: 0M041408 DRAWING NUMBER FIGURE 8
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q:\projects\beazer\_projects\carbondale\cadd\2008 annual report\Figure 10.dwg Last Saved By: Dredniak 2/25/2009 11:41 AM Plotted By: Don Bredniak 2/25/2009 11:41 AM Scale: 1:1

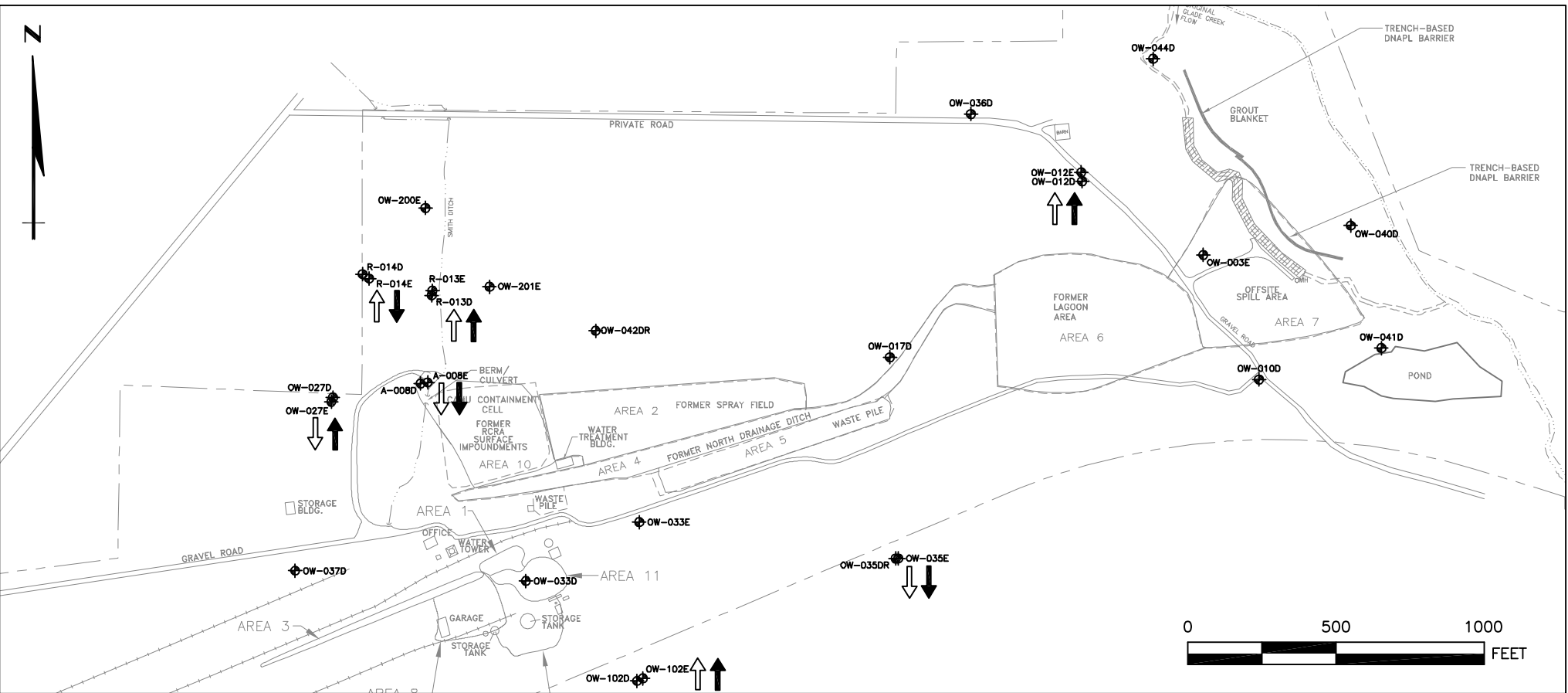


A-UNIT  
B-UNIT  
C-UNIT

## LEGEND

- OW-017D MONITORING WELL
- P-3 PIEZOMETER
- SMITH-1 SURFACE WATER GAUGE
- ↑ FIRST SEMIANNUAL VERTICAL HYDRAULIC GRADIENT DIRECTION
- ↑ SECOND SEMIANNUAL VERTICAL HYDRAULIC GRADIENT DIRECTION

- RAILROAD TRACK
- PROPERTY LINE (APPROXIMATE)
- ROAD
- GRAVEL ACCESS ROAD



D-UNIT  
E-UNIT

BEAZER EAST, INC.  
PITTSBURGH, PENNSYLVANIA

DRWN: DJB DATE: 2/23/09  
CHKD: AYG DATE: 2/23/09  
APPD: KCF DATE: 2/23/09  
SCALE: AS SHOWN  
ISSUE DATE: 1/20/09



FIELD & TECHNICAL  
SERVICES, LLC  
200 THIRD AVENUE  
CARNEGIE, PA 15106

2008 ANNUAL RCRA GROUNDWATER MONITORING REPORT  
FORMER KOPPERS WOOD TREATING SITE  
CARBONDALE, ILLINOIS

2008 VERTICAL HYDRAULIC  
GRADIENT DIRECTIONS

PROJECT NO: OM041408  
DRAWING NUMBER  
FIGURE 10

REV #	DATE	DESCRIPTION	APPD

REFERENCE:

## **APPENDIX A**

### **Summary of 2008 Field and Analytical Data**



**TABLE A-1**  
**Groundwater Field Parameter Data**  
**First Semi-Annual 2008**  
**2008 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

Well	pH (SU)	Specific Conductivity (μS/cm)	Temperature (C)
<b>A Unit</b>			
OW-017A	7.10	1135	14.28
OW-026A	6.39	1121	14.75
OW-027A	6.70	1400	10.03
OW-031A	6.57	475	10.47
OW-041A	7.27	1630	13.97
OW-202A	8.26	1010	12.65
OW-203A	6.59	4001	15.91
OW-204A	6.98	2625	16.20
OW-205A	6.51	4282	14.55
R-013A	8.06	2067	14.35
<b>B Unit</b>			
OW-010B	6.87	3824	12.18
OW-022BR	7.25	3686	10.21
OW-035B	8.38	666	16.08
OW-036B	8.85	1853	16.63
OW-037B	6.90	3277	15.56
OW-039BR2	8.00	3650	16.77
OW-040B	6.93	4686	16.71
OW-041B	7.70	4530	10.49
OW-042B	7.37	3164	11.43
OW-102B	8.81	2608	13.57
OW-202B	8.41	2425	17.00
OW-204B	9.70	3023	12.50
OW-205B	7.14	2667	15.28
<b>C Unit</b>			
OW-017C	7.45	2190	15.09
OW-023C	7.26	4492	15.12
OW-035C	7.49	1740	14.04
R-014C	7.31	2789	16.11
<b>D Unit</b>			
OW-012D	7.60	1621	15.07
OW-023D	7.94	3283	16.75
OW-027D	7.56	6234	14.79
OW-035DR	9.30	-2351	15.30
OW-037D	9.11	6581	16.42
OW-039DR	7.82	1667	13.79
OW-040D	7.78	1659	15.32
OW-041D	7.65	1889	14.82
OW-044D	7.89	1359	13.68
OW-102D	8.41	2949	15.22
OW-202D	8.91	2978	16.32
R-014D	8.10	5178	14.17
<b>E Unit</b>			
OW-003E	8.20	3105	12.99
OW-027E	9.53	17720	13.71
OW-033E	7.24	7342	13.40
OW-035E	12.19	5410	13.70
OW-039ER	7.86	2602	14.90
OW-102E	7.82	15740	15.57
OW-200E	7.89	23231	15.74
OW-201E	8.03	6860	15.53
R-014E	7.77	17831	14.98

**TABLE A-2**  
**Groundwater Field Parameter Data**  
**Second Semi-Annual 2008**  
**2008 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

Well	pH (SU)	Specific Conductivity (µS/cm)	Temperature (C)
<b>A Unit</b>			
OW-017A	6.94	793	18.85
OW-026A	6.34	991	18.24
OW-027A	8.56	1737	19.13
OW-031A	6.24	503	21.06
OW-041A	6.93	1157	20.08
OW-202A	5.91	921	23.38
OW-203A	6.41	2814	20.53
OW-204A	6.82	2665	19.11
OW-205A	6.58	766	18.99
OW-206A	6.72	1942	18.57
OW-207A	7.23	436	16.81
R-013A	6.40	1876	24.84
<b>B Unit</b>			
OW-010B	6.98	2768	18.86
OW-022BR	6.97	2243	17.24
OW-035B	8.43	646	15.43
OW-036B	8.24	1379	16.58
OW-037B	6.84	4021	24.24
OW-039BR2	7.01	3468	15.94
OW-040B	7.38	4104	17.30
OW-041B	7.36	888	22.49
OW-042B	6.69	3659	18.31
OW-102B	7.16	2182	17.46
OW-202B	8.58	2611	20.88
OW-204B	8.93	3398	19.00
OW-205B	6.97	970	18.95
<b>C Unit</b>			
OW-017C	7.48	2214	16.79
OW-023C	7.12	3762	18.13
OW-035C	7.49	1895	19.14
R-014C	7.30	2245	17.40
<b>D Unit</b>			
OW-012D	8.14	1544	23.55
OW-023D	8.29	2836	19.98
OW-027D	7.60	4392	15.22
OW-035DR	8.61	2986	16.25
OW-037D	9.65	6118	17.24
OW-039DR	7.74	1690	16.03
OW-040D	7.83	1537	16.75
OW-041D	7.45	711	21.42
OW-044D	7.86	477	24.34
OW-102D	12.10	3149	16.54
OW-202D	8.84	3408	20.55
R-014D	11.91	3809	16.82
<b>E Unit</b>			
OW-027E	12.15	8678	17.28
OW-033E	7.18	8437	19.42
OW-035E	11.80	4840	16.64
OW-039ER	7.76	2497	16.65
OW-102E	7.94	11490	16.76
OW-200E	7.87	20761	16.44
OW-201E	11.81	6022	17.21
R-014E	8.67	13830	18.84



**TABLE A-3**  
**Analytical Summary**  
**First Semi-Annual 2008 RCRA Groundwater Data**  
**2008 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

ANALYTE	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C-Unit Wells)	OW-003E 2/7/2008	OW-010B 2/6/2008	OW-012D 2/4/2008	OW-017A 2/4/2008	OW-017C 2/5/2008	OW-022BR 2/7/2008	OW-023C 2/6/2008	OW-023D 2/4/2008	OW-026A 2/7/2008	OW-027A 2/6/2008	OW-027D 2/4/2008
<b>Metals (Method 6010B)</b>														
ARSENIC - SOLUBLE	UG/L	50	200	10 U	10 U	10 U	10 U	19.3	10 U	17.4	10 U	195	10 U	10 U
ARSENIC - TOTAL	UG/L	--	--	10 U	10 U	10 U	10 U	17.8	10 U	16.5	10 U	204	10 U	10 U
CHROMIUM - SOLUBLE	UG/L	100	1,000	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHROMIUM - TOTAL	UG/L	--	--	5 U	73.6	5 U	5 U	5 U	228	5 U	11	5 U	5 U	5 U
COPPER - SOLUBLE	UG/L	650	650	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
COPPER - TOTAL	UG/L	--	--	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
<b>BTEX (Method 8021B)</b>														
BENZENE	UG/L	5	25	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	UG/L	700	1,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	UG/L	1,000	2,500	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL XYLENES	UG/L	10,000	10,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
<b>SVOCs (Method 8270C SIM)</b>														
PENTACHLOROPHENOL	UG/L	1	5	0.98 U	1 U	1 U	0.99 U	0.95 U	1.1 U	0.96 U	0.95 U	0.95 U	0.97 U	0.98 U
<b>SVOCs (Method 8270C SIM)</b>														
ACENAPHTHENE	UG/L	420	2,100	0.2 U	0.21 U	0.2 U	0.2 U	0.19 U	0.22 U	0.19 U	0.19 U	2	0.19 U	0.2 U
ACENAPHTHYLENE	UG/L	210	1,050	0.2 U	0.21 U	0.2 U	0.2 U	0.19 U	0.22 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U
ANTHRACENE	UG/L	2,100	10,500	0.2 U	0.21 U	0.2 U	0.2 U	0.19 U	0.22 U	0.19 U	0.19 U	1.1	0.19 U	0.2 U
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	0.13 U	0.23	0.13 U	0.13 U	0.12 U	0.14 U	0.12 U	0.12 U	0.12 U	0.13 U	0.13 U
BENZO(A)PYRENE	UG/L	0.2	2	0.2 U	0.21 U	0.2 U	0.2 U	0.19 U	0.22 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	0.18 U	0.19 U	0.18 U	0.18 U	0.17 U	0.19 U	0.17 U	0.17 U	0.17 U	0.17 U	0.18 U
BENZO(GH)PERYLENE	UG/L	210	1,050	0.2 U	0.21 U	0.2 U	0.2 U	0.19 U	0.22 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	0.17 U	0.18 U	0.17 U	0.17 U	0.16 U	0.18 U	0.16 U	0.16 U	0.16 U	0.16 U	0.17 U
CHRYSENE	UG/L	1.5	7.5	0.2 U	0.23	0.2 U	0.2 U	0.19 U	0.22 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	0.2 U	0.21 U	0.2 U	0.2 U	0.19 U	0.22 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U
FLUORANTHENE	UG/L	280	1,400	0.2 U	0.95	0.2 U	0.2 U	0.19 U	0.22 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U
FLUORENE	UG/L	280	1,400	0.2 U	0.21 U	0.2 U	0.2 U	0.19 U	0.22 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	0.2 U	0.21 U	0.2 U	0.2 U	0.19 U	0.22 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U
NAPHTHALENE	UG/L	140	220	0.2 U	0.21 U	0.2 U	0.2 U	0.19 U	0.22 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U
PHENANTHRENE	UG/L	210	1,050	0.2 U	0.25 B	0.2 U	0.2 U	0.19 U	0.22 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U
PYRENE	UG/L	210	1,050	0.2 U	0.73	0.2 U	0.2 U	0.19 U	0.22 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U
<b>Phenolics (Method 9066)</b>														
PHENOLICS	MG/L	--	--	0.014 B	0.01	0.01 U	0.01 U	0.012	0.011 B	0.012	0.01 U	0.013 B	0.01	0.01 U

**Notes:**

BTEX - benzene, toluene, ethylbenzene, xylenes

SVOCs - semivolatile organic compounds

U - compound was analyzed but not detected

J - an estimated result

DUP - Duplicate sample

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EB - Equipment blank

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Bold - constituent detected

Shade - indicates concentration exceeds TACO (Tiered Approach to Corrective Action Objectives, IEPA) Tier 1 Standard.

**TABLE A-3**  
**Analytical Summary**  
**First Semi-Annual 2008 RCRA Groundwater Data**  
**2008 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

ANALYTE	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C-Unit Wells)	OW-027E 2/7/2008	OW-031A 2/6/2008	OW-033E 2/6/2008	OW-035B 2/2/4/2008	OW-035C 2/6/2008	OW-035DR 2/4/2008	OW-035E 2/6/2008	OW-036B 2/4/2008	OW-037B 2/4/2008	OW-037D 2/4/2008	OW-039BR 2/5/2008
<b>Metals (Method 6010B)</b>														
ARSENIC - SOLUBLE	UG/L	50	200	10 U	10 U	10 U	10 U	20.8	10 U	10 U	10 U	10 U	10 U	10 U
ARSENIC - TOTAL	UG/L	--	--	10 U	10 U	10 U	10 U	19.1	10 U	10 U	10 U	10 U	10 U	10 U
CHROMIUM - SOLUBLE	UG/L	100	1,000	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHROMIUM - TOTAL	UG/L	--	--	5 U	5 U	6.4	5 U	5 U	5 U	5 U	5 U	6.7	5 U	5 U
COPPER - SOLUBLE	UG/L	650	650	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
COPPER - TOTAL	UG/L	--	--	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
<b>BTEX (Method 8021B)</b>														
BENZENE	UG/L	5	25	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	UG/L	700	1,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	UG/L	1,000	2,500	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL XYLENES	UG/L	10,000	10,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
<b>SVOCs (Method 8270C SIM)</b>														
PENTACHLOROPHENOL	UG/L	1	5	1 U	0.94 U	0.94 U	0.99 U	0.95 U	1 U	0.95 U	1 U	1 U	0.94 U	1 U
<b>SVOCs (Method 8270C SIM)</b>														
ACENAPHTHENE	UG/L	420	2,100	0.21 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.2 U	0.2 U	0.19 U	0.2 U
ACENAPHTHYLENE	UG/L	210	1,050	0.21 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.2 U	0.2 U	0.19 U	0.2 U
ANTHRACENE	UG/L	2,100	10,500	0.21 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.2 U	0.2 U	0.19 U	0.2 U
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	0.14 U	0.12 U	0.12 U	0.13 U	0.12 U	0.13 U	0.12 U	0.13 U	0.13 U	0.12 U	0.13 U
BENZO(A)PYRENE	UG/L	0.2	2	0.21 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.2 U	0.2 U	0.19 U	0.2 U
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	0.19 U	0.17 U	0.17 U	0.18 U	0.17 U	0.18 U	0.17 U	0.18 U	0.18 U	0.17 U	0.18 U
BENZO(GH)PERYLENE	UG/L	210	1,050	0.21 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.2 U	0.2 U	0.19 U	0.2 U
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	0.18 U	0.16 U	0.16 U	0.17 U	0.16 U	0.17 U	0.16 U	0.17 U	0.17 U	0.16 U	0.17 U
CHRYSENE	UG/L	1.5	7.5	0.21 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.2 U	0.2 U	0.19 U	0.2 U
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	0.21 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.2 U	0.2 U	0.19 U	0.2 U
FLUORANTHENE	UG/L	280	1,400	0.21 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.2 U	0.2 U	0.19 U	0.2 U
FLUORENE	UG/L	280	1,400	0.21 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.2 U	0.2 U	0.19 U	0.2 U
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	0.21 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.2 U	0.2 U	0.19 U	0.2 U
NAPHTHALENE	UG/L	140	220	0.21 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.2 U	0.2 U	0.19 U	0.2 U
PHENANTHRENE	UG/L	210	1,050	0.21 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.2 U	0.2 U	0.19 U	0.2 U
PYRENE	UG/L	210	1,050	0.21 U	0.19 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.2 U	0.2 U	0.19 U	0.2 U
<b>Phenolics (Method 9066)</b>														
PHENOLICS	MG/L	--	--	0.01 B	0.012	0.011	0.028 B	0.012	0.011 B	0.017	0.01 B	0.01 U	0.01 U	0.012

**Notes:**

BTEX - benzene, toluene, ethylbenzene, xylenes

SVOCs - semivolatile organic compounds

U - compound was analyzed but not detected

J - an estimated result

DUP - Duplicate sample

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**2008 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

ANALYTE	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C-Unit Wells)	OW-039BR - DUP	OW-039DR 2/6/2008	OW-039DR - DUP	OW-039ER 2/4/2008	OW-040B 2/4/2008	OW-040D 2/4/2008	OW-041A 3/5/2008	OW-041B 3/4/2008	OW-041B - DUP	OW-041D 2/5/2008	OW-042B 2/6/2008
<b>Metals (Method 6010B)</b>														
ARSENIC - SOLUBLE	UG/L	50	200	19	10 U	10 U	10 U	10 U	10 U	10 U	71 J	49.7 J	16.6	10 U
ARSENIC - TOTAL	UG/L	--	--	18.4	10 U	10 U	10 U	10 U	10 U	10 U	27.4 J	39.8 J	16.2	10 U
CHROMIUM - SOLUBLE	UG/L	100	1,000	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHROMIUM - TOTAL	UG/L	--	--	5 U	5 U	5 U	5 U	5 U	5 U	326	5 U	5 U	5 U	5 U
COPPER - SOLUBLE	UG/L	650	650	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
COPPER - TOTAL	UG/L	--	--	25 U	25 U	25 U	25 U	25 U	25 U	27.9	25 U	25 U	25 U	25 U
<b>BTEX (Method 8021B)</b>														
BENZENE	UG/L	5	25	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	UG/L	700	1,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	UG/L	1,000	2,500	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL XYLENES	UG/L	10,000	10,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
<b>SVOCs (Method 8270C SIM)</b>														
PENTACHLOROPHENOL	UG/L	1	5	0.94 U	0.94 U	0.96 U	0.95 U	0.95 U	0.96 U	0.94 U	0.94 U	0.94 U	0.99 U	0.97 U
<b>SVOCs (Method 8270C SIM)</b>														
ACENAPHTHENE	UG/L	420	2,100	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.23 B	0.19 U	0.2 U	0.19 U
ACENAPHTHYLENE	UG/L	210	1,050	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U
ANTHRACENE	UG/L	2,100	10,500	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.13 U	0.13 U
BENZO(A)PYRENE	UG/L	0.2	2	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.18 U	0.17 U
BENZO(GH)PERYLENE	UG/L	210	1,050	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.17 U	0.16 U
CHRYSENE	UG/L	1.5	7.5	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U
FLUORANTHENE	UG/L	280	1,400	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.24	0.19 U	0.19 U	0.2 U	0.19 U
FLUORENE	UG/L	280	1,400	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.23 B	0.19 U	0.2 U	0.19 U
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U
NAPHTHALENE	UG/L	140	220	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U
PHENANTHRENE	UG/L	210	1,050	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 B	0.46 B	0.62 B	0.48 B	0.2 U	0.19 U
PYRENE	UG/L	210	1,050	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U
<b>Phenolics (Method 9066)</b>														
PHENOLICS	MG/L	--	--	0.011	0.01	0.01	0.01 U	0.044 B	0.01 B	0.01 U	0.013	0.011	0.019	0.013

**Notes:**

BTEX - benzene, toluene, ethylbenzene, xylenes

SVOCs - semivolatile organic compounds

U - compound was analyzed but not detected

J - an estimated result

DUP - Duplicate sample

B - field blank contamination

EB - Equipment blank

TB - Trip blank

Bold - constituent detected

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**2008 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

ANALYTE	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C-Unit Wells)	OW-044D 2/5/2008	OW-102B 2/5/2008	OW-102D 2/5/2008	OW-102D - DUP	OW-102E 2/5/2008	OW-200E 2/4/2008	OW-201E 2/5/2008	OW-202A 2/5/2008	OW-202B 2/5/2008	OW-202D 2/5/2008	OW-203A 2/4/2008
<b>Metals (Method 6010B)</b>														
ARSENIC - SOLUBLE	UG/L	50	200	10 U	10 U	<b>10</b>	10 U	10 U	10 U	10 U	10 U	10 U	<b>16.2</b>	10 U
ARSENIC - TOTAL	UG/L	--	--	10 U	10 U	<b>10.3</b>	<b>11</b>	10 U	10 U	10 U	10 U	10 U	<b>16.2</b>	10 U
CHROMIUM - SOLUBLE	UG/L	100	1,000	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	<b>6.8</b>
CHROMIUM - TOTAL	UG/L	--	--	<b>7.5</b>	<b>11.8</b>	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	<b>58.8</b>
COPPER - SOLUBLE	UG/L	650	650	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
COPPER - TOTAL	UG/L	--	--	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
<b>BTEX (Method 8021B)</b>														
BENZENE	UG/L	5	25	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	UG/L	700	1,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	UG/L	1,000	2,500	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL XYLENES	UG/L	10,000	10,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
<b>SVOCs (Method 8270C SIM)</b>														
PENTACHLOROPHENOL	UG/L	1	5	0.96 U	1 U	0.98 U	1 U	0.99 U	1 U	0.95 U	1.1 U	0.99 U	0.96 U	0.95 U
<b>SVOCs (Method 8270C SIM)</b>														
ACENAPHTHENE	UG/L	420	2,100	0.19 U	0.21 U	0.2 U	0.21 U	0.2 U	0.21 U	0.19 U	0.22 U	0.2 U	0.19 U	0.19 U
ACENAPHTHYLENE	UG/L	210	1,050	0.19 U	0.21 U	0.2 U	0.21 U	0.2 U	0.21 U	0.19 U	0.22 U	0.2 U	0.19 U	0.19 U
ANTHRACENE	UG/L	2,100	10,500	0.19 U	0.21 U	0.2 U	0.21 U	0.2 U	0.21 U	0.19 U	0.22 U	0.2 U	0.19 U	0.19 U
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	0.12 U	0.13 U	0.13 U	0.13 U	0.13 U	0.14 U	0.12 U	0.14 U	0.13 U	0.12 U	0.12 U
BENZO(A)PYRENE	UG/L	0.2	2	0.19 U	0.21 U	0.2 U	0.21 U	0.2 U	0.21 U	0.19 U	0.22 U	0.2 U	0.19 U	0.19 U
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	0.17 U	0.19 U	0.18 U	0.19 U	0.18 U	0.19 U	0.17 U	0.2 U	0.18 U	0.17 U	0.17 U
BENZO(GH)PERYLENE	UG/L	210	1,050	0.19 U	0.21 U	0.2 U	0.21 U	0.2 U	0.21 U	0.19 U	0.22 U	0.2 U	0.19 U	0.19 U
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	0.16 U	0.18 U	0.17 U	0.18 U	0.17 U	0.18 U	0.16 U	0.19 U	0.17 U	0.16 U	0.16 U
CHRYSENE	UG/L	1.5	7.5	0.19 U	0.21 U	0.2 U	0.21 U	0.2 U	0.21 U	0.19 U	0.22 U	0.2 U	0.19 U	0.19 U
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	0.19 U	0.21 U	0.2 U	0.21 U	0.2 U	0.21 U	0.19 U	0.22 U	0.2 U	0.19 U	0.19 U
FLUORANTHENE	UG/L	280	1,400	0.19 U	0.21 U	0.2 U	0.21 U	0.2 U	0.21 U	0.19 U	0.22 U	0.2 U	0.19 U	0.19 U
FLUORENE	UG/L	280	1,400	0.19 U	0.21 U	0.2 U	0.21 U	0.2 U	0.21 U	0.19 U	0.22 U	0.2 U	0.19 U	0.19 U
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	0.19 U	0.21 U	0.2 U	0.21 U	0.2 U	0.21 U	0.19 U	0.22 U	0.2 U	0.19 U	0.19 U
NAPHTHALENE	UG/L	140	220	0.19 U	0.21 U	0.2 U	0.21 U	<b>0.27</b>	0.21 U	0.19 U	0.22 U	0.2 U	0.19 U	<b>0.68 B</b>
PHENANTHRENE	UG/L	210	1,050	0.19 U	0.21 U	0.2 U	0.21 U	0.2 U	<b>0.24 B</b>	0.19 U	0.22 U	0.2 U	0.19 U	<b>0.21 B</b>
PYRENE	UG/L	210	1,050	0.19 U	0.21 U	0.2 U	0.21 U	0.2 U	0.21 U	0.19 U	0.22 U	0.2 U	0.19 U	0.19 U
<b>Phenolics (Method 9066)</b>														
PHENOLICS	MG/L	--	--	<b>0.012</b>	<b>0.013</b>	<b>0.015</b>	<b>0.014</b>	<b>0.015</b>	0.01 U	<b>0.025</b>	<b>0.017</b>	<b>0.01</b>	<b>0.027</b>	0.01 U

**Notes:**

BTEX - benzene, toluene, ethylbenzene, xylenes

SVOCs - semivolatile organic compounds

U - compound was analyzed but not detected

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DUP - Duplicate sample

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**Analytical Summary**  
**First Semi-Annual 2008 RCRA Groundwater Data**  
**2008 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

ANALYTE	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C-Unit Wells)	OW-204A 2/4/2008	OW-204B 2/7/2008	OW-205A 3/10/2008	OW-205B 3/10/2008	R-013A 2/5/2008	R-013A - DUP	R-014C 2/5/2008	R-014C - DUP	R-014D 2/6/2008	R-014E 2/5/2008
<b>Metals (Method 6010B)</b>													
ARSENIC - SOLUBLE	UG/L	50	200	10 U	10 U	10 U	10 U	10 U	10 U	15.6	15.8	10 U	10 U
ARSENIC - TOTAL	UG/L	--	--	10 U	10 U	10 U	10 U	10 U	10 U	14.5	14	10 U	10 U
CHROMIUM - SOLUBLE	UG/L	100	1,000	7.5	110	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
CHROMIUM - TOTAL	UG/L	--	--	1290	106	5 U	5 U	5.1	5 U	20.3	16	5 U	5 U
COPPER - SOLUBLE	UG/L	650	650	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
COPPER - TOTAL	UG/L	--	--	26.5	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
<b>BTEX (Method 8021B)</b>													
BENZENE	UG/L	5	25	1 U	1 U	7.3	7.1	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	UG/L	700	1,000	1 U	1 U	19	20	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	UG/L	1,000	2,500	1 U	1 U	3	4.3	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL XYLENES	UG/L	10,000	10,000	1 U	1 U	12	26	1 U	1 U	1 U	1 U	1 U	1 U
<b>SVOCs (Method 8270C SIM)</b>													
PENTACHLOROPHENOL	UG/L	1	5	0.97 U	1 U	240 U	240 U	1.1 U	1.1 U	1 U	1.1 U	1 U	0.94 U
<b>SVOCs (Method 8270C SIM)</b>													
ACENAPHTHENE	UG/L	420	2,100	0.19 U	0.21 U	47 U	61	0.22 U	0.22 U	0.21 U	0.22 U	0.2 U	0.19 U
ACENAPHTHYLENE	UG/L	210	1,050	0.19 U	0.21 U	47 U	47 U	0.22 U	0.22 U	0.21 U	0.22 U	0.2 U	0.19 U
ANTHRACENE	UG/L	2,100	10,500	0.19 U	0.21 U	47 U	47 U	0.25	0.35	0.21 U	0.22 U	0.2 U	0.19 U
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	0.13 U	0.13 U	31 U	31 U	0.14 U	0.15 U	0.14 U	0.14 U	0.13 U	0.12 U
BENZO(A)PYRENE	UG/L	0.2	2	0.19 U	0.21 U	47 U	47 U	0.22 U	0.22 U	0.21 U	0.22 U	0.2 U	0.19 U
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	0.17 U	0.19 U	42 U	42 U	0.19 U	0.2 U	0.19 U	0.19 U	0.18 U	0.17 U
BENZO(GH)PERYLENE	UG/L	210	1,050	0.19 U	0.21 U	47 U	47 U	0.22 U	0.22 U	0.21 U	0.22 U	0.2 U	0.19 U
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	0.16 U	0.18 U	40 U	40 U	0.18 U	0.19 U	0.18 U	0.18 U	0.17 U	0.16 U
CHRYSENE	UG/L	1.5	7.5	0.19 U	0.21 U	47 U	47 U	0.22 U	0.22 U	0.21 U	0.22 U	0.2 U	0.19 U
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	0.19 U	0.21 U	47 U	47 U	0.22 U	0.22 U	0.21 U	0.22 U	0.2 U	0.19 U
FLUORANTHENE	UG/L	280	1,400	0.19 U	0.21 U	47 U	47 U	0.22 U	0.22 U	0.21 U	0.22 U	0.2 U	0.19 U
FLUORENE	UG/L	280	1,400	0.19 U	0.21 U	47 U	47 U	0.22 U	0.22 U	0.21 U	0.22 U	0.2 U	0.19 U
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	0.19 U	0.21 U	47 U	47 U	0.22 U	0.22 U	0.21 U	0.22 U	0.2 U	0.19 U
NAPHTHALENE	UG/L	140	220	0.44 B	0.21 U	1600	1500	0.22 U	0.22 U	0.21 U	0.22 U	0.2 U	0.4
PHENANTHRENE	UG/L	210	1,050	0.27 B	0.21 U	47 U	47 U	0.22 U	0.22 U	0.21 U	0.22 U	0.2 U	0.19 U
PYRENE	UG/L	210	1,050	0.19 U	0.21 U	47 U	47 U	0.22 U	0.22 U	0.21 U	0.22 U	0.2 U	0.19 U
<b>Phenolics (Method 9066)</b>													
PHENOLICS	MG/L	--	--	0.01 B	0.012 B	0.019	0.036	0.012	0.089	0.011	0.011	0.013	0.01 U

**Notes:**

BTEX - benzene, toluene, ethylbenzene, xylenes

SVOCs - semivolatile organic compounds

U - compound was analyzed but not detected

J - an estimated result

DUP - Duplicate sample

B - field blank contamination

EB - Equipment blank

TB - Trip blank

Bold - constituent detected

Shade - indicates concentration exceeds TACO (Tiered Approach to Corrective Action Objectives, IEPA) Tier 1 Standard.

**TABLE A-3**  
**Analytical Summary**  
**First Semi-Annual 2008 RCRA Groundwater Data**  
**2008 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

ANALYTE	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C- Unit Wells)	BOTTLE BLANK 2/4/2008	EB 2/4/2008	EB 2/4/2008	EB 2/7/2008	EB 2/7/2008	EB 3/4/2008	TB 2/4/2008	TB 2/5/2008	TB 2/6/2008	TB 2/7/2008	TB 3/4/2008	TB 3/5/2008	TB 3/10/2008
<b>Metals (Method 6010B)</b>																
ARSENIC - SOLUBLE	UG/L	50	200	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA	NA
ARSENIC - TOTAL	UG/L	--	--	10 U	10 U	10 U	10 U	10 U	10 U	NA	NA	NA	NA	NA	NA	NA
CHROMIUM - SOLUBLE	UG/L	100	1,000	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA	NA	NA	NA	NA	NA
CHROMIUM - TOTAL	UG/L	--	--	5 U	5 U	5 U	5 U	5 U	5 U	NA	NA	NA	NA	NA	NA	NA
COPPER - SOLUBLE	UG/L	650	650	25 U	25 U	25 U	25 U	25 U	25 U	NA	NA	NA	NA	NA	NA	NA
COPPER - TOTAL	UG/L	--	--	25 U	25 U	25 U	25 U	25 U	25 U	NA	NA	NA	NA	NA	NA	NA
<b>BTEX (Method 8021B)</b>																
BENZENE	UG/L	5	25	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ETHYLBENZENE	UG/L	700	1,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOLUENE	UG/L	1,000	2,500	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TOTAL XYLENES	UG/L	10,000	10,000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
<b>SVOCs (Method 8270C SIM)</b>																
PENTACHLOROPHENOL	UG/L	1	5	0.95 U	0.99 U	0.94 U	0.95 U	1.1 U	0.95 U	NA	NA	NA	NA	NA	NA	NA
<b>SVOCs (Method 8270C SIM)</b>																
ACENAPHTHENE	UG/L	420	2,100	0.19 U	0.2 U	0.19 U	0.19 U	0.21 U	<b>0.47</b>	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHYLENE	UG/L	210	1,050	0.19 U	0.2 U	0.19 U	0.19 U	0.21 U	0.19 U	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	UG/L	2,100	10,500	0.19 U	0.2 U	0.19 U	0.19 U	0.21 U	0.19 U	NA	NA	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	0.12 U	0.13 U	0.12 U	0.12 U	0.14 U	0.12 U	NA	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	UG/L	0.2	2	0.19 U	0.2 U	0.19 U	0.19 U	0.21 U	0.19 U	NA	NA	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	0.17 U	0.18 U	0.17 U	0.17 U	0.19 U	0.17 U	NA	NA	NA	NA	NA	NA	NA
BENZO(GH)PERYLENE	UG/L	210	1,050	0.19 U	0.2 U	0.19 U	0.19 U	0.21 U	0.19 U	NA	NA	NA	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	0.16 U	0.17 U	0.16 U	0.16 U	0.18 U	0.16 U	NA	NA	NA	NA	NA	NA	NA
CHRYSENE	UG/L	1.5	7.5	0.19 U	0.2 U	0.19 U	0.19 U	0.21 U	0.19 U	NA	NA	NA	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	0.19 U	0.2 U	0.19 U	0.19 U	0.21 U	0.19 U	NA	NA	NA	NA	NA	NA	NA
FLUORANTHENE	UG/L	280	1,400	0.19 U	0.2 U	0.19 U	0.19 U	0.21 U	<b>0.54</b>	NA	NA	NA	NA	NA	NA	NA
FLUORENE	UG/L	280	1,400	0.19 U	0.2 U	0.19 U	0.19 U	0.21 U	<b>0.64</b>	NA	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	0.19 U	0.2 U	0.19 U	0.19 U	0.21 U	0.19 U	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	UG/L	140	220	0.19 U	<b>0.61</b>	0.19 U	0.19 U	0.21 U	<b>0.37</b>	NA	NA	NA	NA	NA	NA	NA
PHENANTHRENE	UG/L	210	1,050	<b>0.2</b>	<b>0.25</b>	0.19 U	0.19 U	0.21 U	<b>2.1</b>	NA	NA	NA	NA	NA	NA	NA
PYRENE	UG/L	210	1,050	0.19 U	0.2 U	0.19 U	0.19 U	0.21 U	<b>0.29</b>	NA	NA	NA	NA	NA	NA	NA
<b>Phenolics (Method 9066)</b>																
PHENOLICS	MG/L	--	--	0.01 U	<b>0.011</b>	0.01 U	<b>0.011</b>	<b>0.01</b>	0.01 U	NA	NA	NA	NA	NA	NA	NA

**Notes:**

BTEX - benzene, toluene, ethylbenzene, xylenes

SVOCs - semivolatile organic compounds

U - compound was analyzed but not detected

J - an estimated result

DUP - Duplicate sample

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TB - Trip blank

Bold - constituent detected

Shade - indicates concentration exceeds TACO (Tiered Approach  
to Corrective Action Objectives, IEPA) Tier 1 Standard.

**TABLE A-4**  
**Analytical Summary**  
**Second Semi-Annual 2008 RCRA Groundwater Data**  
**2008 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

ANALYTE_NAME	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C- Unit Wells)	OW-010B 8/28/2008	OW-012D 8/25/2008	OW-017A 8/25/2008	OW-017C 8/27/2008	OW-017C DUP	OW-022BR 8/27/2008	OW-023C 8/27/2008	OW-023D 8/27/2008	OW-026A 8/28/2008
<b>Metals (Method 6010B)</b>												
ARSENIC - SOLUBLE	UG/L	50	200	6.2 J	2.5 J	10.0 U	10.9	10.4	10.0 U	5 J	10.0 U	240
ARSENIC - TOTAL	UG/L	--	--	8.3 J	3 J	10.0 U	12.7	12.6	10.0 U	5.8 J	10.0 U	287
CHROMIUM - SOLUBLE	UG/L	100	1,000	1.7 J	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	3.2 J
CHROMIUM - TOTAL	UG/L	--	--	83	2.2 J	4.6 J	15.4	15.1	54	3.6 J	384	4 J
COPPER - SOLUBLE	UG/L	650	650	1.7 U	25.0 U	25.0 U	25.0 U	25.0 U	25.0 U	25.0 U	25.0 U	25.0 U
COPPER - TOTAL	UG/L	--	--	4.4 U	25.0 U	9.4 J	25.0 U	25.0 U	3.5 J	0.88 J	3.1 J	1.1 U
<b>BTEX (Method 8021B)</b>												
BENZENE	UG/L	5	25	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
ETHYLBENZENE	UG/L	700	1,000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
TOLUENE	UG/L	1,000	2,500	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
TOTAL XYLENES	UG/L	10,000	10,000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
<b>SVOCs (Method 8270C SIM)</b>												
PENTACHLOROPHENOL	UG/L	1	5	0.96 U	0.96 U	0.97 U	0.97 U	0.96 U	0.97 U	0.96 U	0.98 U	0.96 U
<b>SVOCs (Method 8270C SIM)</b>												
ACENAPHTHENE	UG/L	420	2,100	0.043 J	0.19 U	0.094 J	0.057 J	0.19 U	0.14 J	0.14 J	0.2 U	3.5
ACENAPHTHYLENE	UG/L	210	1,050	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.12 J
ANTHRACENE	UG/L	2,100	10,500	0.19 U	0.19 U	0.039 J	0.19 U	0.19 U	0.035 J	0.038 J	0.2 U	1.5
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	0.066 J	0.12 U	0.058 JB	0.13 U	0.12 U	0.021 J	0.023 J	0.13 U	0.31
BENZO(A)PYRENE	UG/L	0.2	2	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.36
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	0.073 J	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.18 U	0.4
BENZO(GHI)PERYLENE	UG/L	210	1,050	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.44
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	0.062 J	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.17 U	0.36
CHRYSENE	UG/L	1.5	7.5	0.052 J	0.19 U	0.056 J	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.29
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.32
FLUORANTHENE	UG/L	280	1,400	0.12 J	0.19 U	0.2	0.05 J	0.19 U	0.71	0.079 J	0.2 U	0.2
FLUORENE	UG/L	280	1,400	0.048 J	0.037 J	0.086 J	0.078 J	0.19 U	0.37	0.18 J	0.2 U	0.34
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.2 U	0.45
NAPHTHALENE	UG/L	140	220	0.19 U	0.11 JB	0.24 B	0.19 U	0.19 U	0.057 J	0.086 J	0.2 U	0.6
PHENANTHRENE	UG/L	210	1,050	0.13 J	0.087 JB	0.29 B	0.34	0.19 U	0.19	0.48	0.2 U	0.49
PYRENE	UG/L	210	1,050	0.11 J	0.19 U	0.16 J	0.023 J	0.19 U	0.39	0.056 J	0.2 U	0.18 J
<b>Phenolics (Method 9066)</b>												
PHENOLICS	MG/L	--	--	0.0065 JB	0.01 U	0.01 U	0.0088 JB	0.0078 JB	0.0081 JB	0.011 B	0.0079 JB	0.013 B

**Notes:**

BTEX - benzene, toluene, ethylbenzene, xylenes

SVOCs - semivolatile organic compounds

U - compound was analyzed but not detected

J - an estimated result

DUP - Duplicate sample

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to Corrective Action objectives, IEPA) Tier 1 Standard.



**TABLE A-4**  
**Analytical Summary**  
**Second Semi-Annual 2008 RCRA Groundwater Data**  
**2008 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

ANALYTE_NAME	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C- Unit Wells)	OW-027A 8/26/2008	OW-027D 8/26/2008	OW-027E 8/26/2008	OW-031A 8/26/2008	OW-033E 8/26/2008	OW-035B 8/26/2008	OW-035C 8/27/2008	OW-035DR 8/26/2008	OW-035E 8/27/2008
<b>Metals (Method 6010B)</b>												
ARSENIC - SOLUBLE	UG/L	50	200	26.4	4.5 J	10.0 U	10.0 U	10.0 U	10.0 U	10.2	10.0 U	10.0 U
ARSENIC - TOTAL	UG/L	--	--	26.6	4 J	10.0 U	10.0 U	10.0 U	10.0 U	9.3 J	10.0 U	10.0 U
CHROMIUM - SOLUBLE	UG/L	100	1,000	1.8 J	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
CHROMIUM - TOTAL	UG/L	--	--	3.8 J	36.9	5.7	5.0 U	4.7 B	5.0 U	2.3 J	5.0 U	48.1
COPPER - SOLUBLE	UG/L	650	650	25.0 U	25.0 U	25.0 U	25.0 U	25.0 U	25.0 U	25.0 U	25.0 U	25.0 U
COPPER - TOTAL	UG/L	--	--	25.0 U	25.0 U	25.0 U	25.0 U	25.0 U	32	25.0 U	25.0 U	138
<b>BTEX (Method 8021B)</b>												
BENZENE	UG/L	5	25	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
ETHYLBENZENE	UG/L	700	1,000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
TOLUENE	UG/L	1,000	2,500	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
TOTAL XYLENES	UG/L	10,000	10,000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
<b>SVOCs (Method 8270C SIM)</b>												
PENTACHLOROPHENOL	UG/L	1	5	1 U	0.94 U	0.96 U	0.97 U	0.97 U	0.95 U	0.96 U	0.95 U	0.94 U
<b>SVOCs (Method 8270C SIM)</b>												
ACENAPHTHENE	UG/L	420	2,100	0.2 U	0.19 U	0.083 JB	0.083 JB	0.086 JB	0.11 JB	0.19 U	0.12 JB	0.097 J
ACENAPHTHYLENE	UG/L	210	1,050	0.2 U	0.19 U	0.05 J	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
ANTHRACENE	UG/L	2,100	10,500	0.2 U	0.19 U	0.19 U	0.11 JB	0.038 JB	0.042 JB	0.19 U	0.035 JB	0.043 J
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	0.13 U	0.12 U	0.12 U	0.029 JB	0.31 B	0.046 JB	0.12 U	0.029 JB	0.063 J
BENZO(A)PYRENE	UG/L	0.2	2	0.2 U	0.19 U	0.19 U	0.19 U	0.19 B	0.19 U	0.19 U	0.19 U	0.19 U
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	0.18 U	0.17 U	0.17 U	0.17 U	0.42 B	0.17 U	0.17 U	0.17 U	0.088 J
BENZO(GHI)PERYLENE	UG/L	210	1,050	0.2 U	0.19 U	0.19 U	0.19 U	0.2 B	0.19 U	0.19 U	0.19 U	0.19 U
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	0.17 U	0.16 U	0.16 U	0.16 U	0.15 JB	0.16 U	0.16 U	0.16 U	0.094 J
CHRYSENE	UG/L	1.5	7.5	0.2 U	0.19 U	0.19 U	0.19 U	0.33 B	0.19 U	0.19 U	0.19 U	0.065 J
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
FLUORANTHENE	UG/L	280	1,400	0.072 JB	0.048 JB	0.038 JB	0.11 JB	0.25 B	0.44 B	0.19 U	0.055 JB	0.1 J
FLUORENE	UG/L	280	1,400	0.044 JB	0.19 U	0.12 JB	0.083 JB	0.049 JB	0.15 JB	0.19 U	0.11 JB	0.075 J
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	0.2 U	0.19 U	0.19 U	0.19 U	0.19	0.19 U	0.19 U	0.19 U	0.19 U
NAPHTHALENE	UG/L	140	220	0.2 U	0.056 JB	0.26 B	0.44	0.19 U	0.1 JB	0.19 U	0.31	0.44
PHENANTHRENE	UG/L	210	1,050	0.2 U	0.11 JB	0.17 JB	0.33 B	0.14 JB	0.27 B	0.19 U	0.22 B	0.21
PYRENE	UG/L	210	1,050	0.046 JB	0.03 JB	0.032 JB	0.065 JB	0.24 B	0.5 B	0.19 U	0.059 JB	0.12 J
<b>Phenolics (Method 9066)</b>												
PHENOLICS	MG/L	--	--	0.0073 J	0.01 U	0.015	0.01 U	0.01 U	0.01 U	0.0063 JB	0.0062 J	0.01 B

**Notes:**

BTEX - benzene, toluene, ethylbenzene, xylenes

SVOCs - semivolatile organic compounds

U - compound was analyzed but not detected

J - an estimated result

DUP - Duplicate sample

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Bold - constituent detected

Shade - indicates concentration exceeds TACO (Tiered Approach  
to Corrective Action objectives, IEPA) Tier 1 Standard.

**TABLE A-4**  
**Analytical Summary**  
**Second Semi-Annual 2008 RCRA Groundwater Data**  
**2008 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

ANALYTE_NAME	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C- Unit Wells)	OW-036B 8/26/2008	OW-037B 8/26/2008	OW-037D 8/26/2008	OW-039BR2 8/26/2008	OW-039DR 8/26/2008	OW-039ER 8/25/2008	OW-040B 8/26/2008	OW-040D 8/27/2008	OW-041A 8/28/2008
<b>Metals (Method 6010B)</b>												
ARSENIC - SOLUBLE	UG/L	50	200	10.0 U	<b>3.9 J</b>	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
ARSENIC - TOTAL	UG/L	--	--	10.0 U	10.0 U	10.0 U	<b>3.7 J</b>	10.0 U	10.0 U	10.0 U	10.0 U	<b>4.7 J</b>
CHROMIUM - SOLUBLE	UG/L	100	1,000	5.0 U	5.0 U	5.0 U	<b>5</b>	5.0 U	5.0 U	5.0 U	<b>4.5 J</b>	5.0 U
CHROMIUM - TOTAL	UG/L	--	--	<b>13.1</b>	<b>2.4 J</b>	<b>1.3 J</b>	<b>1210</b>	5.0 U	<b>2.2 J</b>	5.0 U	<b>3.4 J</b>	<b>216</b>
COPPER - SOLUBLE	UG/L	650	650	25.0 U	25.0 U	25.0 U	25.0 U	25.0 U	25.0 U	25.0 U	<b>1.6 J</b>	3 U
COPPER - TOTAL	UG/L	--	--	<b>2 J</b>	25.0 U	25.0 U	<b>35.7</b>	25.0 U	25.0 U	<b>22.1 J</b>	<b>7.5 J</b>	<b>39.2</b>
<b>BTEX (Method 8021B)</b>												
BENZENE	UG/L	5	25	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
ETHYLBENZENE	UG/L	700	1,000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
TOLUENE	UG/L	1,000	2,500	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
TOTAL XYLENES	UG/L	10,000	10,000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
<b>SVOCs (Method 8270C SIM)</b>												
PENTACHLOROPHENOL	UG/L	1	5	0.94 U	0.97 U	0.94 U	1 U	0.97 U	0.96 U	0.94 U	0.96 U	0.95 U
<b>SVOCs (Method 8270C SIM)</b>												
ACENAPHTHENE	UG/L	420	2,100	<b>0.074 JB</b>	<b>0.051 JB</b>	<b>0.045 JB</b>	0.21 U	<b>0.061 JB</b>	0.19 U	<b>0.041 JB</b>	0.19 U	0.19 U
ACENAPHTHYLENE	UG/L	210	1,050	0.19 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
ANTHRACENE	UG/L	2,100	10,500	0.19 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	0.12 U	0.13 U	0.12 U	<b>0.063 JB</b>	<b>0.065 JB</b>	0.12 U	<b>0.02 JB</b>	0.12 U	<b>0.038 J</b>
BENZO(A)PYRENE	UG/L	0.2	2	0.19 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	0.17 U	0.17 U	0.17 U	<b>0.14 JB</b>	<b>0.13 JB</b>	0.17 U	0.17 U	0.17 U	0.17 U
BENZO(GHI)PERYLENE	UG/L	210	1,050	0.19 U	0.19 U	0.19 U	<b>0.17 JB</b>	<b>0.15 JB</b>	0.19 U	0.19 U	0.19 U	0.19 U
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	0.16 U	0.16 U	0.16 U	<b>0.17 JB</b>	<b>0.15 JB</b>	0.16 U	0.16 U	0.16 U	0.16 U
CHRYSENE	UG/L	1.5	7.5	0.19 U	0.19 U	0.19 U	<b>0.09 JB</b>	<b>0.099 JB</b>	0.19 U	0.19 U	0.19 U	0.19 U
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	0.19 U	0.19 U	0.19 U	<b>0.23</b>	<b>0.16 J</b>	0.19 U	0.19 U	0.19 U	0.19 U
FLUORANTHENE	UG/L	280	1,400	<b>0.059 JB</b>	0.19 U	<b>0.031 JB</b>	<b>0.06 JB</b>	<b>0.072 JB</b>	0.19 U	<b>0.039 JB</b>	<b>0.047 J</b>	<b>0.052 J</b>
FLUORENE	UG/L	280	1,400	<b>0.074 JB</b>	<b>0.045 JB</b>	<b>0.051 JB</b>	<b>0.05 JB</b>	<b>0.065 JB</b>	0.19 U	<b>0.05 JB</b>	<b>0.045 J</b>	<b>0.058 J</b>
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	0.19 U	0.19 U	0.19 U	<b>0.18 JB</b>	<b>0.15 JB</b>	0.19 U	0.19 U	0.19 U	0.19 U
NAPHTHALENE	UG/L	140	220	<b>0.19 B</b>	0.19 U	<b>0.22 B</b>	0.21 U	<b>0.081 JB</b>	0.19 U	<b>0.064 JB</b>	0.19 U	0.19 U
PHENANTHRENE	UG/L	210	1,050	<b>0.21 B</b>	<b>0.14 JB</b>	<b>0.12 JB</b>	<b>0.17 JB</b>	<b>0.18 JB</b>	0.19 U	<b>0.14 JB</b>	<b>0.18 J</b>	<b>0.14 J</b>
PYRENE	UG/L	210	1,050	<b>0.039 JB</b>	0.19 U	0.19 U	<b>0.036 JB</b>	<b>0.059 JB</b>	0.19 U	<b>0.022 JB</b>	<b>0.025 J</b>	<b>0.042 J</b>
<b>Phenolics (Method 9066)</b>												
PHENOLICS	MG/L	--	--	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U

**Notes:**

BTEX - benzene, toluene, ethylbenzene, xylenes

SVOCs - semivolatile organic compounds

U - compound was analyzed but not detected

J - an estimated result

DUP - Duplicate sample

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**Analytical Summary**  
**Second Semi-Annual 2008 RCRA Groundwater Data**  
**2008 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

ANALYTE_NAME	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C- Unit Wells)	OW-041B 8/28/2008	OW-041D 8/27/2008	OW-042B 8/26/2008	OW-044D 8/26/2008	OW-102B 8/26/2008	OW-102D 8/27/2008	OW-102E 8/28/2008	OW-102E DUP	OW-200E 8/27/2008
<b>Metals (Method 6010B)</b>												
ARSENIC - SOLUBLE	UG/L	50	200	<b>67</b>	<b>8.8 J</b>	10.0 U	<b>2.5 J</b>	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U
ARSENIC - TOTAL	UG/L	--	--	<b>76.7</b>	<b>9.4 J</b>	10.0 U	10.0 U	10.0 U	10.0 U	<b>2.5 J</b>	<b>2.4 J</b>	10.0 U
CHROMIUM - SOLUBLE	UG/L	100	1,000	5.0 U	5.0 U	<b>10.1</b>	5.0 U	5.0 U	<b>2 J</b>	5.0 U	5.0 U	5.0 U
CHROMIUM - TOTAL	UG/L	--	--	<b>4.9 J</b>	<b>2 J</b>	<b>21.5</b>	<b>24.8</b>	<b>2.5 J</b>	<b>2.9 J</b>	<b>2.3 J</b>	<b>1.8 J</b>	<b>2.8 J</b>
COPPER - SOLUBLE	UG/L	650	650	1.2 U	25.0 U	25.0 U	25.0 U	25.0 U	25.0 U	1.7 U	1.3 U	25.0 U
COPPER - TOTAL	UG/L	--	--	4.6 U	25.0 U	25.0 U	<b>1.8 J</b>	25.0 U	<b>0.98 J</b>	3.1 U	2.8 U	<b>3 J</b>
<b>BTEX (Method 8021B)</b>												
BENZENE	UG/L	5	25	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
ETHYLBENZENE	UG/L	700	1,000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
TOLUENE	UG/L	1,000	2,500	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
TOTAL XYLENES	UG/L	10,000	10,000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
<b>SVOCs (Method 8270C SIM)</b>												
PENTACHLOROPHENOL	UG/L	1	5	0.95 U	0.96 U	0.98 U	0.95 U	0.96 U	0.94 U	0.95 U	0.95 U	0.97 U
<b>SVOCs (Method 8270C SIM)</b>												
ACENAPHTHENE	UG/L	420	2,100	<b>0.056 J</b>	0.19 U	<b>0.048 JB</b>	0.19 U	0.19 U	0.19 U	<b>0.046 J</b>	<b>0.054 J</b>	<b>0.054 J</b>
ACENAPHTHYLENE	UG/L	210	1,050	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
ANTHRACENE	UG/L	2,100	10,500	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	0.12 U	0.12 U	0.13 U	0.12 U	<b>0.034 JB</b>	<b>0.02 J</b>	<b>0.031 J</b>	<b>0.031 J</b>	0.13 U
BENZO(A)PYRENE	UG/L	0.2	2	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	0.17 U	0.17 U	0.18 U	0.17 U	0.17 U	0.17 U	0.17 U	<b>0.045 J</b>	0.17 U
BENZO(GHI)PERYLENE	UG/L	210	1,050	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	0.16 U	0.16 U	0.17 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U
CHRYSENE	UG/L	1.5	7.5	0.19 U	0.19 U	0.2 U	0.19 U	<b>0.038 JB</b>	0.19 U	0.19 U	0.19 U	0.19 U
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
FLUORANTHENE	UG/L	280	1,400	<b>0.038 J</b>	0.19 U	<b>0.04 JB</b>	<b>0.031 JB</b>	0.19 U	<b>0.038 J</b>	<b>0.053 J</b>	<b>0.064 J</b>	<b>0.029 J</b>
FLUORENE	UG/L	280	1,400	<b>0.061 J</b>	0.19 U	<b>0.06 JB</b>	<b>0.052 JB</b>	0.19 U	<b>0.067 J</b>	<b>0.046 J</b>	<b>0.06 J</b>	<b>0.058 J</b>
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	0.19 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
NAPHTHALENE	UG/L	140	220	<b>0.098 J</b>	0.19 U	<b>0.065 JB</b>	<b>0.044 JB</b>	<b>0.069 JB</b>	<b>0.1 J</b>	<b>0.17 J</b>	<b>0.17 J</b>	<b>0.095 J</b>
PHENANTHRENE	UG/L	210	1,050	<b>0.17 J</b>	0.19 U	<b>0.16 JB</b>	<b>0.19 B</b>	0.19 U	<b>0.16 J</b>	<b>0.13 J</b>	<b>0.24 J</b>	<b>0.23</b>
PYRENE	UG/L	210	1,050	<b>0.028 J</b>	0.19 U	<b>0.029 JB</b>	<b>0.026 JB</b>	0.19 U	0.19 U	<b>0.05 J</b>	<b>0.047 J</b>	0.19 U
<b>Phenolics (Method 9066)</b>												
PHENOLICS	MG/L	--	--	<b>0.0057 JB</b>	<b>0.011 B</b>	0.01 U	0.01 U	0.01 U	<b>0.013 B</b>	<b>0.0067 JB</b>	<b>0.0083 JB</b>	<b>0.01 B</b>

**Notes:**

BTEX - benzene, toluene, ethylbenzene, xylenes

SVOCs - semivolatile organic compounds

U - compound was analyzed but not detected

J - an estimated result

DUP - Duplicate sample

B - field blank contamination

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Bold - constituent detected

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**Analytical Summary**  
**Second Semi-Annual 2008 RCRA Groundwater Data**  
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**Carbondale Facility, Carbondale, Illinois**

ANALYTE_NAME	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C- Unit Wells)	OW-201E 8/27/2008	OW-201E DUP	OW-202A 8/25/2008	OW-202A 12/11/2008	OW-202B 8/25/2008	OW-202D 8/27/2008	OW-203A 8/27/2008	OW-204A 9/16/2008	OW-204B 9/16/2008
<b>Metals (Method 6010B)</b>												
ARSENIC - SOLUBLE	UG/L	50	200	10.0 U	10.0 U	10.0 U	--	10.0 U	<b>14.8</b>	10.0 U	10 U	10 U
ARSENIC - TOTAL	UG/L	--	--	10.0 U	10.0 U	10.0 U	--	10.0 U	<b>14.2</b>	10.0 U	10 U	10 U
CHROMIUM - SOLUBLE	UG/L	100	1,000	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	<b>2.7 J</b>	5 U	<b>114</b>
CHROMIUM - TOTAL	UG/L	--	--	<b>1.8 J</b>	<b>2 J</b>	<b>2.3 J</b>	--	<b>3.4 J</b>	5.0 U	<b>20.9</b>	<b>817</b>	<b>118</b>
COPPER - SOLUBLE	UG/L	650	650	25.0 U	<b>0.9 J</b>	25.0 U	--	25.0 U	25.0 U	<b>3.4 J</b>	25 U	25 U
COPPER - TOTAL	UG/L	--	--	<b>559</b>	<b>646</b>	<b>3.3 J</b>	--	25.0 U	25.0 U	<b>6.1 J</b>	25 U	25 U
<b>BTEX (Method 8021B)</b>												
BENZENE	UG/L	5	25	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1 U	1 U
ETHYLBENZENE	UG/L	700	1,000	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1 U	1 U
TOLUENE	UG/L	1,000	2,500	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1 U	1 U
TOTAL XYLENES	UG/L	10,000	10,000	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1 U	1 U
<b>SVOCs (Method 8270C SIM)</b>												
PENTACHLOROPHENOL	UG/L	1	5	0.96 U	0.98 U	<b>0.3 J</b>	0.94 U	0.96 U	0.96 U	0.95 U	0.94 U	0.94 U
<b>SVOCs (Method 8270C SIM)</b>												
ACENAPHTHENE	UG/L	420	2,100	<b>0.23</b>	<b>0.25</b>	0.19 U	0.19 U	0.19 U	0.19 U	<b>0.16 J</b>	0.19 U	0.19 U
ACENAPHTHYLENE	UG/L	210	1,050	0.19 U	<b>0.099 J</b>	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
ANTHRACENE	UG/L	2,100	10,500	<b>0.057 J</b>	<b>0.068 J</b>	<b>1.5</b>	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	<b>0.036 J</b>	<b>0.033 J</b>	<b>11</b>	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
BENZO(A)PYRENE	UG/L	0.2	2	0.19 U	0.2 U	<b>7.4</b>	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	0.17 U	0.18 U	<b>10</b>	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
BENZO(GHI)PERYLENE	UG/L	210	1,050	0.19 U	0.2 U	<b>11</b>	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	0.16 U	0.17 U	<b>13</b>	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U
CHRYSENE	UG/L	1.5	7.5	0.19 U	0.2 U	<b>12</b>	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	0.19 U	0.2 U	<b>13</b>	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
FLUORANTHENE	UG/L	280	1,400	<b>0.14 J</b>	<b>0.14 J</b>	<b>1.9</b>	0.19 U	0.19 U	0.19 U	<b>0.11 J</b>	0.19 U	0.19 U
FLUORENE	UG/L	280	1,400	<b>0.21</b>	<b>0.18 J</b>	<b>0.14 J</b>	0.19 U	<b>0.041 J</b>	0.19 U	<b>0.16 J</b>	0.19 U	0.19 U
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	0.19 U	0.2 U	<b>10</b>	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
NAPHTHALENE	UG/L	140	220	<b>0.96</b>	<b>0.9</b>	0.19 U	0.19 U	0.19 U	0.19 U	<b>0.38</b>	0.19 U	0.19 U
PHENANTHRENE	UG/L	210	1,050	<b>0.55</b>	<b>0.52</b>	<b>0.47</b>	0.19 U	<b>0.11 JB</b>	0.19 U	<b>0.44</b>	<b>0.19</b>	0.19 U
PYRENE	UG/L	210	1,050	<b>0.1 J</b>	<b>0.088 J</b>	<b>2.1</b>	0.19 U	0.19 U	0.19 U	<b>0.068 J</b>	0.19 U	0.19 U
<b>Phenolics (Method 9066)</b>												
PHENOLICS	MG/L	--	--	<b>0.022 B</b>	<b>0.023 B</b>	<b>0.0074 J</b>	--	0.01 U	<b>0.0071 JB</b>	0.01 U	0.01 U	0.01 U

**Notes:**

BTEX - benzene, toluene, ethylbenzene, xylenes

SVOCs - semivolatile organic compounds

U - compound was analyzed but not detected

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**Analytical Summary**  
**Second Semi-Annual 2008 RCRA Groundwater Data**  
**2008 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

ANALYTE_NAME	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C- Unit Wells)	OW-205A 8/26/2008	OW-205B 9/16/2008	OW-206A 8/28/2008	OW-207A 9/16/2008	R-013A 8/27/2008	R-014C 8/27/2008	R-014D 8/26/2008	R-014D - DUP	R-014E 8/28/2008
<b>Metals (Method 6010B)</b>												
ARSENIC - SOLUBLE	UG/L	50	200	4.2 J	NA	10.0 U	10 U	10.0 U	13.6	3.3 J	3.3 J	10.0 U
ARSENIC - TOTAL	UG/L	--	--	3.3 J	NA	9.8 J	27.9	10.0 U	12.3	10.0 U	10.0 U	10.0 U
CHROMIUM - SOLUBLE	UG/L	100	1,000	1.7 J	NA	5.0 U	5 U	1.7 J	5.0 U	5.0 U	5.0 U	5.0 U
CHROMIUM - TOTAL	UG/L	--	--	1.3 J	NA	84.2	269	2.6 J	2.6 J	5.0 U	5.0 U	5.0 U
COPPER - SOLUBLE	UG/L	650	650	25.0 U	NA	8.6 J	33.6	25.0 U	25.0 U	25.0 U	25.0 U	1.7 J
COPPER - TOTAL	UG/L	--	--	25.0 U	NA	83.4	1720	25.0 U	25.0 U	25.0 U	25.0 U	3.6 J
<b>BTEX (Method 8021B)</b>												
BENZENE	UG/L	5	25	7.5	50 U	1.0 U	1 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
ETHYLBENZENE	UG/L	700	1,000	30	50 U	1.0 U	1 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
TOLUENE	UG/L	1,000	2,500	3.6	50 U	1.0 U	1 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
TOTAL XYLENES	UG/L	10,000	10,000	1.07	58	1.0 U	1 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
<b>SVOCs (Method 8270C SIM)</b>												
PENTACHLOROPHENOL	UG/L	1	5	240 U	240 U	0.087 J	0.94 U	0.94 U	0.95 U	0.95 U	0.96 U	0.95 U
<b>SVOCs (Method 8270C SIM)</b>												
ACENAPHTHENE	UG/L	420	2,100	150	420	0.35	0.22	0.19 U	0.19 U	0.19 U	0.19 U	0.1 J
ACENAPHTHYLENE	UG/L	210	1,050	48 U	48 U	0.15 J	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
ANTHRACENE	UG/L	2,100	10,500	48 U	68	0.32	0.19 U	0.038 J	0.19 U	0.19 U	0.19 U	0.19 U
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	31 U	65	0.17	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U	0.12 U
BENZO(A)PYRENE	UG/L	0.2	2	48 U	48 U	0.28	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	43 U	43 U	0.45	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U	0.17 U
BENZO(GHI)PERYLENE	UG/L	210	1,050	48 U	48 U	0.26	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	41 U	40 U	0.2	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U	0.16 U
CHRYSENE	UG/L	1.5	7.5	48 U	54	0.25	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	48 U	48 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
FLUORANTHENE	UG/L	280	1,400	48 U	330	0.35	0.24	0.05 J	0.19 U	0.19 U	0.19 U	0.19 U
FLUORENE	UG/L	280	1,400	79	280	0.24	0.2	0.047 J	0.19 U	0.045 JB	0.044 JB	0.1 J
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	48 U	48 U	0.24	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U
NAPHTHALENE	UG/L	140	220	3700	4600	0.36	0.19 U	0.19 U	0.19 U	0.076 JB	0.084 JB	0.26
PHENANTHRENE	UG/L	210	1,050	91	820	0.5	0.46	0.27	0.19 U	0.13 JB	0.11 JB	0.19
PYRENE	UG/L	210	1,050	48 U	240	0.37	0.19	0.024 J	0.19 U	0.19 U	0.19 U	0.19 U
<b>Phenolics (Method 9066)</b>												
PHENOLICS	MG/L	--	--	0.044	0.041	0.01 U	0.01 U	0.0087 JB	0.0062 JB	0.01 U	0.0083 JB	0.01 U

**Notes:**

BTEX - benzene, toluene, ethylbenzene, xylenes

SVOCs - semivolatile organic compounds

U - compound was analyzed but not detected

J - an estimated result

DUP - Duplicate sample

B - field blank contamination

EB - Equipment blank

TB - Trip blank

Bold - constituent detected

Shade - indicates concentration exceeds TACO (Tiered Approach  
to Corrective Action objectives, IEPA) Tier 1 Standard.

**TABLE A-4**  
**Analytical Summary**  
**Second Semi-Annual 2008 RCRA Groundwater Data**  
**2008 Annual RCRA Groundwater Monitoring Report**  
**Carbondale Facility, Carbondale, Illinois**

ANALYTE_NAME	UNITS	Class I (D- and E-Unit Wells)	Class II (A/B and C- Unit Wells)	BOTTLE BLANK 8/28/2008	EB 8/25/2008	EB 8/26/2008	EB 8/27/2008	EB 8/28/2008	TRIP BLANK 8/25/2008	TRIP BLANK 8/25/2008	TRIP BLANK 8/26/2008	TRIP BLANK 8/26/2008	TRIP BLANK 8/27/2008	TRIP BLANK 8/28/2008	TRIP BLANK 9/16/2008
<b>Metals (Method 6010B)</b>															
ARSENIC - SOLUBLE	UG/L	50	200	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	NA	NA	NA	NA	NA	NA	NA
ARSENIC - TOTAL	UG/L	--	--	10.0 U	10.0 U	10.0 U	10.0 U	10.0 U	NA	NA	NA	NA	NA	NA	NA
CHROMIUM - SOLUBLE	UG/L	100	1,000	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	NA	NA	NA	NA	NA	NA	NA
CHROMIUM - TOTAL	UG/L	--	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	NA	NA	NA	NA	NA	NA	NA
COPPER - SOLUBLE	UG/L	650	650	<b>0.93 J</b>	25.0 U	25.0 U	25.0 U	<b>1.1 J</b>	NA	NA	NA	NA	NA	NA	NA
COPPER - TOTAL	UG/L	--	--	<b>1 J</b>	25.0 U	25.0 U	25.0 U	<b>0.94 J</b>	NA	NA	NA	NA	NA	NA	NA
<b>BTEX (Method 8021B)</b>															
BENZENE	UG/L	5	25	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U
ETHYLBENZENE	UG/L	700	1,000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U
TOLUENE	UG/L	1,000	2,500	1.0 U	<b>0.73 J</b>	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U
TOTAL XYLENES	UG/L	10,000	10,000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U
<b>SVOCs (Method 8270C SIM)</b>															
PENTACHLOROPHENOL	UG/L	1	5	0.96 U	0.95 U	0.95 U	0.99 U	0.95 U	NA	NA	NA	NA	NA	NA	NA
<b>SVOCs (Method 8270C SIM)</b>															
ACENAPHTHENE	UG/L	420	2,100	0.19 U	0.19 U	<b>0.13 J</b>	0.2 U	0.19 U	NA	NA	NA	NA	NA	NA	NA
ACENAPHTHYLENE	UG/L	210	1,050	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	NA	NA	NA	NA	NA	NA	NA
ANTHRACENE	UG/L	2,100	10,500	0.19 U	0.19 U	<b>0.052 J</b>	0.2 U	0.19 U	NA	NA	NA	NA	NA	NA	NA
BENZO(A)ANTHRACENE	UG/L	0.13	0.65	0.12 U	<b>0.030 J</b>	<b>0.31</b>	0.13 U	0.12 U	NA	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	UG/L	0.2	2	0.19 U	0.19 U	<b>0.24</b>	0.2 U	0.19 U	NA	NA	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	UG/L	0.13	0.9	0.17 U	<b>0.059 J</b>	<b>0.41</b>	0.18 U	0.17 U	NA	NA	NA	NA	NA	NA	NA
BENZO(GH)PERYLENE	UG/L	210	1,050	0.19 U	0.19 U	<b>0.2</b>	0.2 U	0.19 U	NA	NA	NA	NA	NA	NA	NA
BENZO(K)FLUORANTHENE	UG/L	0.17	0.85	0.16 U	0.16 U	<b>0.44</b>	0.17 U	0.16 U	NA	NA	NA	NA	NA	NA	NA
CHRYSENE	UG/L	1.5	7.5	0.19 U	0.19 U	<b>0.37</b>	0.2 U	0.19 U	NA	NA	NA	NA	NA	NA	NA
DIBENZO(A,H)ANTHRACENE	UG/L	0.3	1.5	0.19 U	0.19 U	0.19 U	0.2 U	0.19 U	NA	NA	NA	NA	NA	NA	NA
FLUORANTHENE	UG/L	280	1,400	0.19 U	<b>0.035 J</b>	<b>0.44</b>	0.2 U	0.19 U	NA	NA	NA	NA	NA	NA	NA
FLUORENE	UG/L	280	1,400	0.19 U	0.19 U	<b>0.047 J</b>	0.2 U	0.19 U	NA	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	UG/L	0.43	2.15	0.19 U	0.19 U	<b>0.18 J</b>	0.2 U	0.19 U	NA	NA	NA	NA	NA	NA	NA
NAPHTHALENE	UG/L	140	220	0.19 U	<b>0.054 J</b>	<b>0.057 J</b>	0.2 U	0.19 U	NA	NA	NA	NA	NA	NA	NA
PHENANTHRENE	UG/L	210	1,050	0.19 U	<b>0.090 J</b>	<b>0.2</b>	0.2 U	0.19 U	NA	NA	NA	NA	NA	NA	NA
PYRENE	UG/L	210	1,050	0.19 U	<b>0.027 J</b>	<b>0.33</b>	0.2 U	0.19 U	NA	NA	NA	NA	NA	NA	NA
<b>Phenolics (Method 9066)</b>															
PHENOLICS	MG/L	--	--	<b>0.0084 J</b>	0.01 U	0.01 U	<b>0.0077 J</b>	<b>0.0081 J</b>	NA	NA	NA	NA	NA	NA	NA

**Notes:**

BTEX - benzene, toluene, ethylbenzene, xylenes

SVOCs - semivolatile organic compounds

U - compound was analyzed but not detected

J - an estimated result

DUP - Duplicate sample

B - field blank contamination

EB - Equipment blank

TB - Trip blank

Bold - constituent detected

Shade - indicates concentration exceeds TACO (Tiered Approach  
to Corrective Action objectives, IEPA) Tier 1 Standard.

## **APPENDIX B**

### **Data Evaluation Reports for 2008**



## FTS, LLC

DATE: February 28, 2008

FROM: Kendra Chintella

SUBJECT: Carbondale Semi-Annual GW

SAMPLE DELIVERY GROUP (SDG): C8B050187

SAMPLES: EB01, EB02, BOTTLE BLANK, OW-204A, OW-39ER, OW-12D, OW-203A, OW-37B, OW-23D, OW-17A, OW-37D, OW-27D, OW-35B, OW-40B, OW-200E, OW-036B, OW-40D, OW-35DR, TRIP BLANK

ANALYSES: Method 8021B (VOCs), 8270C/SIM (SVOCs), 6010B (Total/Dissolved Metals), 9066 (Phenolics)

LABORATORY: TestAmerica Laboratories, Inc., Pittsburgh

The data contained in this SDG were evaluated with regard to the following parameters:

- ☐ Data Completeness  
Noncompliances: None
- ☐ Holding Times  
Noncompliances: None
- ☐ Laboratory Blank Contamination  
Noncompliances: None
- ☐ Field Blank Contamination  
**Noncompliances: Naphthalene and total recoverable phenolics were detected in the aqueous equipment blank. Phenanthrene was detected in the equipment blank and the bottle blank. See next page for details.**
- ☐ Surrogate Recoveries  
Noncompliances: None
- ☐ Matrix Spike and Matrix Spike Duplicate  
Noncompliances: None
- ☐ Laboratory Control Sample  
Noncompliances: None

**Field Blank Contamination:**

The following analytes were detected in the aqueous equipment blank, EB01, at the following concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Blank Action Level</u>
Naphthalene	0.61 ug/L	3.05 ug/L
Phenanthrene	0.25 ug/L	1.25 ug/L
Total Recoverable Phenolics	0.011 mg/L	0.055 mg/L

The following analyte was detected in the bottle blank at the following concentration:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Blank Action Level</u>
Phenanthrene	0.20 ug/L	1.00 ug/L

An action level of 5X the maximum concentration was used to evaluate the sample data for field blank contamination. Associated samples with concentrations below the blank action level were qualified as "B", for field blank contamination.

## FTS, LLC

DATE: February 28, 2008

FROM: Kendra Chintella

SUBJECT: Carbondale Semi-Annual GW

SAMPLE DELIVERY GROUP (SDG): C8B060297

SAMPLES: OW-44D, R-14E, OW-102B, OW-102D, M-99A(OW-102D), OW-202A, OW-102E, OW-201E, OW-202B, R-013A, R-99B(R-013A), OW-17C, OW-99C(OW-39BR), R-14C, OW-99D(R-14C), OW-39BR, OW-41D, TRIP BLANK, OW-202D

ANALYSES: Method 8021B (VOCs), 8270C/SIM (SVOCs), 6010B (Total/Dissolved Metals), 9066 (Phenolics)

LABORATORY: TestAmerica Laboratories, Inc., Pittsburgh

The data contained in this SDG were evaluated with regard to the following parameters:

- ☐ Data Completeness  
Noncompliances: None
- ☐ Holding Times  
Noncompliances: None
- ☐ Laboratory Blank Contamination  
Noncompliances: None
- ☐ Field Blank Contamination  
Noncompliances: None
- ☐ Field Duplicate Precision:  
Noncompliances: See attached page for details.
- ☐ Surrogate Recoveries  
Noncompliances: None
- ☐ Matrix Spike and Matrix Spike Duplicate  
**Noncompliances: The percent recovery of total recoverable phenolics was outside of the control limit. No action was taken on this basis as the LCS recovery was compliant.**
- ☐ Laboratory Control Sample  
Noncompliances: None

**Field Duplicate Precision:**

FIELD DUPLICATE PRECISION					
ANALYTE	OW-102D	QUAL	M-99A	QUAL	RPD
Arsenic, total	10.3		11		6.57
Arsenic, dissolved	10		10	U	NC
Total Recoverable Phenolics	0.015		0.014		6.90

FIELD DUPLICATE PRECISION					
ANALYTE	R-013A	QUAL	R-99B	QUAL	RPD
Anthracene	0.25		0.35		33.33*
Chromium, total	5.1		5	U	NC
Total Recoverable Phenolics	0.012		0.089		152.48*

FIELD DUPLICATE PRECISION					
ANALYTE	OW-039BR	QUAL	OW-99C	QUAL	RPD
Arsenic, total	10	U	18.4		NC
Arsenic, dissolved	10	U	19		NC
Total Recoverable Phenolics	0.012		0.011		8.70

FIELD DUPLICATE PRECISION					
ANALYTE	R-14C	QUAL	OW-99D	QUAL	RPD
Arsenic, total	14.5		14		3.51
Chromium, total	20.3		16		23.69
Arsenic, dissolved	15.6		15.8		1.27
Total Recoverable Phenolics	0.011		0.011		0

NC RPD not calculated due to nondetect result

\* RPD is greater than 30%, the associated sample are qualified as estimated, "J", due to laboratory or field sampling imprecision.

**FTS, LLC**

**DATE:** February 28, 2008

**FROM:** Kendra Chintella

**SUBJECT:** Carbondale Semi-Annual GW

**SAMPLE DELIVERY GROUP (SDG):** C8B070136

**SAMPLES:** OW-31A, OW-33E, R-14D, OW-42B, OW-35C, OW-23C, OW-27A, OW-39DR, OW-10B, OW-99E(OW-39DR), OW-35E, TRIP BLANK

**ANALYSES:** Method 8021B (VOCs), 8270C/SIM (SVOCs), 6010B (Total/Dissolved Metals), 9066 (Phenolics)

**LABORATORY:** TestAmerica Laboratories, Inc., Pittsburgh

The data contained in this SDG were evaluated with regard to the following parameters:

- ☐ Data Completeness  
Noncompliances: None
- ☐ Holding Times  
Noncompliances: None
- ☐ Laboratory Blank Contamination  
Noncompliances: None
- ☐ Field Blank Contamination  
Noncompliances: None
- ☐ Field Duplicate Precision:  
Noncompliances: See attached page for details.
- ☐ Surrogate Recoveries  
Noncompliances: None
- ☐ Matrix Spike and Matrix Spike Duplicate  
Noncompliances: None
- ☐ Laboratory Control Sample  
Noncompliances: None

**Field Duplicate Precision:**

FIELD DUPLICATE PRECISION					
ANALYTE	OW-39DR	QUAL	OW-99E	QUAL	RPD
Total Recoverable Phenolics	0.01		0.01		0

## FTS, LLC

DATE: February 28, 2008

FROM: Kendra Chintella

SUBJECT: Carbondale Semi-Annual GW

SAMPLE DELIVERY GROUP (SDG): C8B080310

SAMPLES: OW-204B, OW-26A, OW-003E, OW-27E, EB03, EB04, OW-22BR, TRIP BLANK

ANALYSES: Method 8021B (VOCs), 8270C/SIM (SVOCs), 6010B (Total/Dissolved Metals), 9066 (Phenolics)

LABORATORY: TestAmerica Laboratories, Inc., Pittsburgh

The data contained in this SDG were evaluated with regard to the following parameters:

- ☐ Data Completeness  
Noncompliances: None
- ☐ Holding Times  
Noncompliances: None
- ☐ Laboratory Blank Contamination  
Noncompliances: None
- ☐ Field Blank Contamination  
**Noncompliances: Total recoverable phenolics was detected in the aqueous equipment blanks. See next page for details.**
- ☐ Surrogate Recoveries  
Noncompliances: None
- ☐ Matrix Spike and Matrix Spike Duplicate  
Noncompliances: None
- ☐ Laboratory Control Sample  
Noncompliances: None



**Field Blank Contamination:**

The following analyte was detected in the aqueous equipment blank, EB03, at the following concentration:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Blank Action Level</u>
Total Recoverable Phenolics	0.011 mg/L	0.055 mg/L

The following analyte was detected in the aqueous equipment blank, EB04, at the following concentration:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Blank Action Level</u>
Total Recoverable Phenolics	0.010 mg/L	0.050 mg/L

An action level of 5X the maximum concentration was used to evaluate the sample data for field blank contamination. Associated samples with concentrations below the blank action level were qualified as "B", for field blank contamination.

## FTS, LLC

DATE: March 27, 2008

FROM: Kendra Chintella

SUBJECT: Carbondale Semi-Annual GW

SAMPLE DELIVERY GROUP (SDG): C8C050325, C8C060293, C8C110260

SAMPLES: OW-41B, OW-41B-99F, EB1, TRIP BLANK (C8C050325), OW-041A, TRIP BLANK (C8C060293), OW-205A, OW-205B, TRIP BLANK (C8C110260)

ANALYSES: Method 8021B (VOCs), 8270C/SIM (SVOCs), 6010B (Total/Dissolved Metals), 9066 (Phenolics)

LABORATORY: TestAmerica Laboratories, Inc., Pittsburgh

The data contained in this SDG were evaluated with regard to the following parameters:

- ☐ Data Completeness  
Noncompliances: None
- ☐ Holding Times  
Noncompliances: None
- ☐ Laboratory Blank Contamination  
Noncompliances: None
- ☐ Field Blank Contamination  
**Noncompliances: Several SVOCs were detected in the aqueous equipment blank. See next page for details.**
- ☐ Field Duplicate Precision:  
Noncompliances: See attached page for details.
- ☐ Surrogate Recoveries  
Noncompliances: None
- ☐ Matrix Spike and Matrix Spike Duplicate  
Noncompliances: The MS recovery of total recoverable phenolics was below the control limits. No action was taken as the LCS recovery was compliant.
- ☐ Laboratory Control Sample  
Noncompliances: None

**Field Blank Contamination:**

The following analytes were detected in the aqueous equipment blank, EB1, at the following concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Blank Action Level</u>
Acenaphthene	0.47 ug/L	2.35 ug/L
Fluoranthene	0.54 ug/L	2.70 ug/L
Fluorene	0.64 ug/L	3.20 ug/L
Naphthalene	0.37 ug/L	1.85 ug/L
Phenanthrene	2.1 ug/L	10.5 ug/L
Pyrene	0.29 ug/L	1.45 ug/L

An action level of 5X the maximum concentration was used to evaluate the sample data for field blank contamination. Associated samples with concentrations below the blank action level were qualified as "B", for field blank contamination.

**Field Duplicate Precision:**

FIELD DUPLICATE PRECISION					
ANALYTE	OW-41B	QUAL	OW-41B-99F	QUAL	RPD
Acenaphthene	0.23		0.19	U	NC
Fluorene	0.23		0.19	U	NC
Phenanthrene	0.62		0.48		25.45
Arsenic, Total	27.4		39.8		36.90*
Arsenic, Dissolved	71		49.7		35.29*
Total Recoverable Phenolics	0.013		0.011		16.67

NC RPD not calculated due to nondetect result

\* RPD is greater than 30%, the associated sample are qualified as estimated, "J", due to laboratory or field sampling imprecision.

**FTS, LLC**

**DATE:** September 19, 2008

**FROM:** Kendra Chintella

**SUBJECT:** Carbondale Semi-Annual GW

**SAMPLE DELIVERY GROUP (SDG):** C8H270268

**SAMPLES:** OW-202A, OW-99A(OW-202A), OW-035B, OW-102B

**ANALYSES:** Method 8290 (Dioxins/Furans)

**LABORATORY:** TestAmerica Laboratories, Inc., Pittsburgh

The data contained in this SDG were evaluated with regard to the following parameters:

- ☐ Data Completeness  
Noncompliances: None
- ☐ Holding Times  
Noncompliances: None
- ☐ Laboratory Blank Contamination  
Noncompliances: None
- ☐ Field Duplicate Precision:  
Noncompliances: See attached page for details.
- ☐ Surrogate Recoveries  
Noncompliances: None
- ☐ Matrix Spike and Matrix Spike Duplicate  
Noncompliances: None
- ☐ Laboratory Control Sample  
Noncompliances: None

**Field Duplicate Precision:**

FIELD DUPLICATE PRECISION					
ANALYTE	OW-202A	QUAL	OW-99A	QUAL	RPD
1,2,3,4,6,7,8-HpCDD	70		160		78.26*
1,2,3,4,6,7,8-HpCDF	32	J	53		49.41*
OCDD	690		1800		89.16*
OCDF	110		210		62.5*
Total HpCDD	150		330		75*
Total HpCDF	93		200		73.04*
Total HxCDF	6.4	U	27		NC

NC RPD not calculated due to nondetect result

\* RPD is greater than 30%, the associated sample are qualified as estimated, "J", due to laboratory or field sampling imprecision.

## FTS, LLC

DATE: September 17, 2008

FROM: Kendra Chintella

SUBJECT: Carbondale Semi-Annual GW

SAMPLE DELIVERY GROUP (SDG): C8H270310

SAMPLES: OW-202A, OW-202B, OW-39ER, OW-012D, OW-17A, EB-082508, TRIP BLANK 01-082508, OW-39BR2, R-014D, OW-42B, R-99A(R-014D), OW-027A, OW-39DR, EB02-082608, OW-027D, OW-035B, OW-035DR, OW-036B, OW-037D, OW-040B, OW-027E, OW-033E, OW-037B, OW-44D, OW-205A, OW-031A, OW-102B, TRIP BLANK 02-082608

ANALYSES: Method 8021B (VOCs), 8270C/SIM (SVOCs), 6010B (Total/Dissolved Metals), 9066 (Phenolics)

LABORATORY: TestAmerica Laboratories, Inc., Pittsburgh

The data contained in this SDG were evaluated with regard to the following parameters:

- ☐ Data Completeness  
Noncompliances: None
- ☐ Holding Times  
Noncompliances: None
- ☐ Laboratory Blank Contamination  
Noncompliances: None
- ☐ Field Blank Contamination  
**Noncompliances: Several analytes were detected in the equipment blanks. See next page for details.**
- ☐ Field Duplicate Precision:  
Noncompliances: See attached page for details.
- ☐ Surrogate Recoveries  
Noncompliances: The surrogate recovery of phenol-d5(OW-036B, OW-027E) was outside of the control limits. No action was taken.
- ☐ Matrix Spike and Matrix Spike Duplicate  
Noncompliances: None
- ☐ Laboratory Control Sample  
Noncompliances: None

**Field Blank Contamination:**

The following analytes were detected in the aqueous equipment blank, EB-082508, at the following concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Blank Action Level</u>
Benzo(a)anthracene	0.032 J ug/L	0.160 ug/L
Benzo(b)fluoranthene	0.059 J ug/L	0.295 ug/L
Fluoranthene	0.035 J ug	0.175 ug/L
Naphthalene	0.054 J ug/L	0.270 ug/L
Phenanthrene	0.090 J ug/L	0.450 ug/L
Pyrene	0.027 J ug/L	0.135 ug/L
Toluene	0.73 J ug/L	3.65 ug/L

The following analytes were detected in the aqueous equipment blank, EB02-082608, at the following concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Blank Action Level</u>
Acenaphthene	0.13 J ug/L	0.65 ug/L
Anthracene	0.052 J ug/L	0.295 ug/L
Benzo(a)anthracene	0.31 ug/L	1.55 ug/L
Benzo(a)pyrene	0.24 ug/L	1.20 ug/L
Benzo(b)fluoranthene	0.41 ug/L	2.05 ug/L
Benzo(ghi)perylene	0.20 ug/L	1.0 ug/L
Benzo(k)fluoranthene	0.44 ug/L	2.20 ug/L
Chrysene	0.37 ug/L	1.85 ug/L
Fluoranthene	0.44 ug/L	2.20 ug/L
Fluorene	0.074 J ug/L	0.37 ug/L
Indeno(1,2,3-cd)pyrene	0.18 J ug/L	0.90 ug/L
Naphthalene	0.057 J ug/L	0.285 ug/L
Phenanthrene	0.20 ug/L	1.0 ug/L
Pyrene	0.33 ug/L	1.65 ug/L

An action level of 5X the maximum concentration was used to evaluate the sample data for field blank contamination. Associated samples with concentrations below the blank action level were qualified as "B" for field blank contamination.

**Field Duplicate Precision:**

FIELD DUPLICATE PRECISION					
ANALYTE	R-014D	QUAL	R-99A	QUAL	RPD
Arsenic, dissolved	3.3	J	3.3	J	0
Fluorene	0.045	J	0.044	J	2.25
Naphthalene	0.076	J	0.084	J	10
Phenanthrene	0.13	J	0.11	J	16.67
Total Recoverable Phenolics	0.01	U	0.0083	J	NC

NC RPD not calculated due to nondetect result

\* RPD is greater than 30%, the associated sample are qualified as estimated, "J", due to laboratory or field sampling imprecision.



**FTS, LLC**

**DATE:** September 19, 2008

**FROM:** Kendra Chintella

**SUBJECT:** Carbondale Semi-Annual GW

**SAMPLE DELIVERY GROUP (SDG):** C8H280171

**SAMPLES:** OW-022BR

**ANALYSES:** Method 8290 (Dioxins/Furans)

**LABORATORY:** TestAmerica Laboratories, Inc., Pittsburgh

The data contained in this SDG were evaluated with regard to the following parameters:

- ☐ Data Completeness  
Noncompliances: None
- ☐ Holding Times  
Noncompliances: None
- ☐ Laboratory Blank Contamination  
Noncompliances: None
- ☐ Surrogate Recoveries  
Noncompliances: None
- ☐ Matrix Spike and Matrix Spike Duplicate  
Noncompliances: The MS/MSD recovery of 1,2,3,4,7,8-HxCDD was outside of the control limits. No action was taken as the LCS recovery was compliant.
- ☐ Laboratory Control Sample  
Noncompliances: None

## FTS, LLC

DATE: September 17, 2008

FROM: Kendra Chintella

SUBJECT: Carbondale Semi-Annual GW

SAMPLE DELIVERY GROUP (SDG): C8H280283

SAMPLES: OW-201E, OW-040D, OW-035E, OW-99D-0802708(OW-201E), OW-23C, OW-17C, OW-35C, OW-99C(OW-17C), R-14C, OW-22BR, R-013A, OW-203A, OW-200E, OW-102D, OW-23D, EB-03-082708, OW-202D, OW-41D, TRIP BLANK

ANALYSES: Method 8021B (VOCs), 8270C/SIM (SVOCs), 6010B (Total/Dissolved Metals), 9066 (Phenolics)

LABORATORY: TestAmerica Laboratories, Inc., Pittsburgh

The data contained in this SDG were evaluated with regard to the following parameters:

- ☐ Data Completeness  
Noncompliances: None
- ☐ Holding Times  
Noncompliances: None
- ☐ Laboratory Blank Contamination  
Noncompliances: None
- ☐ Field Blank Contamination  
**Noncompliances: Total recoverable phenolics was detected in the equipment blank. See next page for details.**
- ☐ Field Duplicate Precision:  
Noncompliances: See attached page for details.
- ☐ Surrogate Recoveries  
Noncompliances: None
- ☐ Matrix Spike and Matrix Spike Duplicate  
Noncompliances: The MS/MSD recoveries of several analytes were outside of the control limits. The RPD's were also outside of the control limits. No action was taken as the LCS recoveries were compliant.
- ☐ Laboratory Control Sample  
Noncompliances: None

**Field Blank Contamination:**

The following analyte was detected in the aqueous equipment blank, EB-03-082708, at the following concentration:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Blank Action Level</u>
Total Recoverable Phenolics	0.0077 J mg/L	0.0385 mg/L

An action level of 5X the maximum concentration was used to evaluate the sample data for field blank contamination. Associated samples with concentrations below the blank action level were qualified as "B" for field blank contamination.

**Field Duplicate Precision:**

FIELD DUPLICATE PRECISION					
ANALYTE	OW-201E	QUAL	OW-99D	QUAL	RPD
Acenaphthene	0.23		0.25		8.33
Acenaphthylene	0.19	U	0.099	J	NC
Anthracene	0.057	J	0.068	J	17.60
Benzo(a)anthracene	0.036	J	0.033	J	8.70
Chromium, total	1.8	J	2	J	10.53
Copper, dissolved	25	U	0.9	J	NC
Copper, total	559		646		14.44
Fluoranthene	0.14	J	0.14	J	0
Fluorene	0.21		0.18	J	15.38
Naphthalene	0.96		0.9		6.45
Phenanthrene	0.55		0.52		5.61
Pyrene	0.1	J	0.088	J	12.77
Total Recoverable Phenolics	0.022		0.023		4.44
ANALYTE	OW-17C	QUAL	OW-99C	QUAL	RPD
Acenaphthene	0.057	J	0.19	U	NC
Arsenic, dissolved	10.9		10.4		4.69
Arsenic, total	12.7		12.6		0.79
Chromium, total	15.4		15.1		1.97
Fluoranthene	0.05	J	0.19	U	NC
Fluorene	0.078	J	0.19	U	NC
Phenanthrene	0.34		0.19	U	NC
Pyrene	0.023	J	0.19	U	NC
Total Recoverable Phenolics	0.0088	J	0.0078	J	12.05

NC RPD not calculated due to nondetect result

\* RPD is greater than 30%, the associated sample are qualified as estimated, "J", due to laboratory or field sampling imprecision.

## FTS, LLC

DATE: September 19, 2008

FROM: Kendra Chintella

SUBJECT: Carbondale Semi-Annual GW

SAMPLE DELIVERY GROUP (SDG): C8H290272

SAMPLES: OW-102E, R-014E, OW-041A, OW-010B, OW-041B, OW-206A, OW-099E(OW-102E), EB-04-082808, BOTTLE BLANK-082808, TRIP BLANK-04-082808, OW-026A

ANALYSES: Method 8021B (VOCs), 8270C/SIM (SVOCs), 6010B (Total/Dissolved Metals), 9066 (Phenolics)

LABORATORY: TestAmerica Laboratories, Inc., Pittsburgh

The data contained in this SDG were evaluated with regard to the following parameters:

- ☐ Data Completeness  
Noncompliances: None
- ☐ Holding Times  
Noncompliances: None
- ☐ Laboratory Blank Contamination  
**Noncompliances: Total and dissolved copper were detected in the method blank. See next page for details.**
- ☐ Field Blank Contamination  
**Noncompliances: Total and dissolved copper and total recoverable phenolics were detected in the equipment blank and the bottle blank. See next page for details.**
- ☐ Field Duplicate Precision:  
Noncompliances: See attached page for details.
- ☐ Surrogate Recoveries  
Noncompliances: None
- ☐ Matrix Spike and Matrix Spike Duplicate  
Noncompliances: None
- ☐ Laboratory Control Sample  
Noncompliances: None

**Laboratory Blank Contamination:**

The following analytes were detected in the aqueous method blank at the following concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Blank Action Level</u>
Copper, total	1.0 J ug/L	5.0 ug/L
Copper, dissolved	0.99 J ug/L	4.95 ug/L

An action level of 5X the maximum concentration was used to evaluate the sample data for laboratory blank contamination. Associated samples with concentrations below the blank action level were qualified as "U" for laboratory blank contamination.

**Field Blank Contamination:**

The following analytes were detected in the aqueous equipment blank, EB-04-082808, at the following concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Blank Action Level</u>
Copper, total	0.94 J ug/L	4.7 ug/L
Copper, dissolved	1.1 J ug/L	5.5 ug/L
Total Recoverable Phenolics	0.0081 J ug/L	0.0405 ug/L

The following analytes were detected in the aqueous bottle blank, BOTTLE BLANK-082808, at the following concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Blank Action Level</u>
Copper, total	1.0 J ug/L	5.0 ug/L
Copper, dissolved	0.93 J ug/L	4.65 ug/L
Total Recoverable Phenolics	0.0084 J ug/L	0.042 ug/L

An action level of 5X the maximum concentration was used to evaluate the sample data for field blank contamination. Associated samples with concentrations below the blank action level were qualified as "B" for field blank contamination.

**Field Duplicate Precision:**

FIELD DUPLICATE PRECISION					
ANALYTE	OW-102E	QUAL	OW-099E	QUAL	RPD
Acenaphthene	0.046	J	0.054	J	16
Arsenic, total	2.5	J	2.4	J	4.08
Benzo(a)anthracene	0.031	J	0.031	J	0
Benzo(b)fluoranthene	0.17	U	0.045	J	NC
Chromium, total	2.3	J	1.8	J	24.39
Copper, dissolved	1.7	J	1.3	J	26.67
Copper, total	3.1	J	2.8	J	10.17
Fluoranthene	0.053	J	0.064	J	18.80
Fluorene	0.046	J	0.06	J	26.42
Naphthalene	0.17	J	0.17	J	0
Phenanthrene	0.13	J	0.24		59.46*

Pyrene	0.05	J	0.047	J	6.19
Total Recoverable Phenolics	0.0067	J	0.0083	J	21.33

NC RPD not calculated due to nondetect result

\* RPD is greater than 30%, the associated sample are qualified as estimated, "J", due to laboratory or field sampling imprecision.

**FTS, LLC**

**DATE:** October 1, 2008

**FROM:** Kendra Chintella

**SUBJECT:** Carbondale Semi-Annual GW

**SAMPLE DELIVERY GROUP (SDG):** C8I180104

**SAMPLES:** OW-204A, OW-204B, OW-207A, TB, OW-205B

**ANALYSES:** Method 8021B (VOCs), 8270C/SIM (SVOCs), 6010B (Total/Dissolved Metals), 9066 (Phenolics)

**LABORATORY:** TestAmerica Laboratories, Inc., Pittsburgh

The data contained in this SDG were evaluated with regard to the following parameters:

- ☐ Data Completeness  
Noncompliances: None
- ☐ Holding Times  
Noncompliances: None
- ☐ Laboratory Blank Contamination  
Noncompliances: None
- ☐ Field Blank Contamination  
Noncompliances: None
- ☐ Surrogate Recoveries  
Noncompliances: None
- ☐ Matrix Spike and Matrix Spike Duplicate  
Noncompliances: The MS recovery of toluene was outside on the control limits. No action was taken as the LCS recovery was compliant.
- ☐ Laboratory Control Sample  
Noncompliances: None



**FTS, LLC**

**DATE:** January 5, 2009

**FROM:** Kendra Chintella

**SUBJECT:** Carbondale Semi-Annual GW

**SAMPLE DELIVERY GROUP (SDG):** C8L120232

**SAMPLES:** 202A-01, 202A-02, EB01121108, EB02121108, DI BLANK 01 121108, DI BLANK 02 121108

**ANALYSES:** Method 8270C/SIM (SVOCs)

**LABORATORY:** TestAmerica Laboratories, Inc., Pittsburgh

The data contained in this SDG were evaluated with regard to the following parameters:

- ☐ Data Completeness  
Noncompliances: None
- ☐ Holding Times  
Noncompliances: None
- ☐ Laboratory Blank Contamination  
Noncompliances: None
- ☐ Field Blank Contamination  
**Noncompliances:** Naphthalene was detected in the equipment blanks. See next page for details.
- ☐ Surrogate Recoveries  
Noncompliances: None
- ☐ Laboratory Control Sample  
Noncompliances: None

**Field Blank Contamination:**

The following analyte was detected in the aqueous equipment blank, EB01121108, at the following concentration:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Blank Action Level</u>
Naphthalene	0.24 ug/l	1.20 ug/l

The following analyte was detected in the aqueous equipment blank, EB02121108, at the following concentration:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Blank Action Level</u>
Naphthalene	0.21 ug/l	1.05 ug/l

An action level of 5X the maximum concentration was used to evaluate the sample data for field blank contamination. Associated samples with concentrations below the blank action level were qualified as "B" for field blank contamination.